The Newspaper of Information Systems Management
June 19, 1995, Vol. 29, No. 25, 166 Pages, $6/Copy, $48/Year

COMPUTERWORLD

SERVERS: Staking out the enterprise

PCs gaining but not ready for prime time yet

By Craig Stedman, Jaikumar Vijayan and Jean S. Bozman

Compaq Computer Corp. has made a lot of noise lately about how its mighty-mite PC servers are ready to take on the big boys in the mid-range ring.

Yet while the Houston-based company and other PC server vendors are increasingly trading punches with IBM's AS/400 line and a host of Unix-based systems, the contest remains more light sparring than heavy hitting.

Based on recent interviews with more than 20 information systems managers and a dozen industry analysts, it is clear that the use of PC servers continues to be held back by crash-prone hardware, immature software and a lack of management tools that makes support a time-gobbling chore.

COMPUTERWORLD SPECIAL REPORT

There is no doubt that servers based on Intel Corp. chips are starting to muscle their way into mid-range strongholds such as human resources, electronic mail and database access. An estimated 583,500 PC servers were shipped worldwide in 1994 — just about triple the 203,700 units shipped in 1993, according to Dataquest, Inc.

Servers, *page 32*

System software and management ills continue to plague PC servers, according to a Computerworld *customer satisfaction survey. But reliability aches and pains are showing signs of improvement. On a 1-to-10 scale, reliability ratings were as follows:*

Hewlett-Packard	Compaq	IBM
9.0	8.7	8.5

CW Guide, page 99

Novell's support on slippery slope

Reduced staff overwhelmed by increase in service calls

By Laura DiDio

Some large NetWare users say they are fed up and fighting mad about Novell, Inc.'s technical support, which they claim has deteriorated badly since the company bought WordPerfect Corp. last year.

The users fired their most stinging salvos at Novell's support of WordPerfect products, especially the GroupWise electronic-mail, calendaring and scheduling package. The routine downsizing that accompanies any merger has thinned the support ranks among the former WordPerfect group, making it difficult to get timely and knowledgeable responses, the users charged.

This is particularly hard for some users to accept be-

Novell, *page 135*

Lotus buyout

Workgroup wars begin

By Stuart J. Johnston

Two burning questions were on the minds of users and analysts last week when Lotus Development Corp. announced it had acquiesced to IBM's takeover offer.

First, what will the merger mean in terms of combining Lotus and IBM technologies? And how will the new combinations stack up against industry steamroller Microsoft Corp.?

While it is too early to get clear answers to either question, many users and analysts see the rival giants approaching the same problem from completely different directions:

- IBM approaches client/server workgroup computing from a large-scale, centralized computing perspective that includes a clear understanding

Workgroup wars, *page 16*

'Tough love' reins in IS projects

By Julia King

Exasperated by multimillion-dollar cost overruns and delays measured in years, a growing number of large corporations are taking a "tough love" approach to information systems software development.

In the past 18 months, American Express Financial Advisors, Inc., United Air Lines and Ryder Systems, Inc. have all established IS project management offices. Among other things, these offices have sole authority to authorize changes in systems development deadlines and budgets.

Nynex Corp., meanwhile, requires all outside vendors working on Nynex IS projects to comply with the telecommunications company's project management methodology.

What is driving companies to ratchet up discipline on projects previously carried out independently is the staggering cost of software delays and failures.

This year, more than half the software development projects initiated by large companies will cost 189% more than originally estimated, according to a recent study by The Standish Group international, Inc., a market research firm in Dennis, Mass.

When American Express Financial Advisors set up its project office 14 months ago, budget overruns of as high as 500% were not uncommon at the Minneapolis-based company,

Tough love, *page 25*

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AS/400 takes RISC plunge into PC, database servers

By Craig Stedman

IBM's long-awaited RISC rebirth of the AS/400 this week will include a major upward expansion of the server-specific models the company aims at PC-oriented customers, industry sources said.

Server throughput is expected to increase more than threefold through the use of 64-bit PowerPC microprocessors.

That could be enough to turn the AS/400 into a viable database server for data warehousing applications, analysts said. The AS/400 has been largely locked out of that key growth market because of raw power limitations compared with Unix-based systems and even PC servers.

Overall, the PowerPC-based AS/400s, which IBM will introduce Wednesday at PC Expo in New York, are expected to provide a 50% performance boost over the existing line with no big increase in pricing, said Peter Burris, an analyst at Meta Group, Inc. in Stamford, Conn.

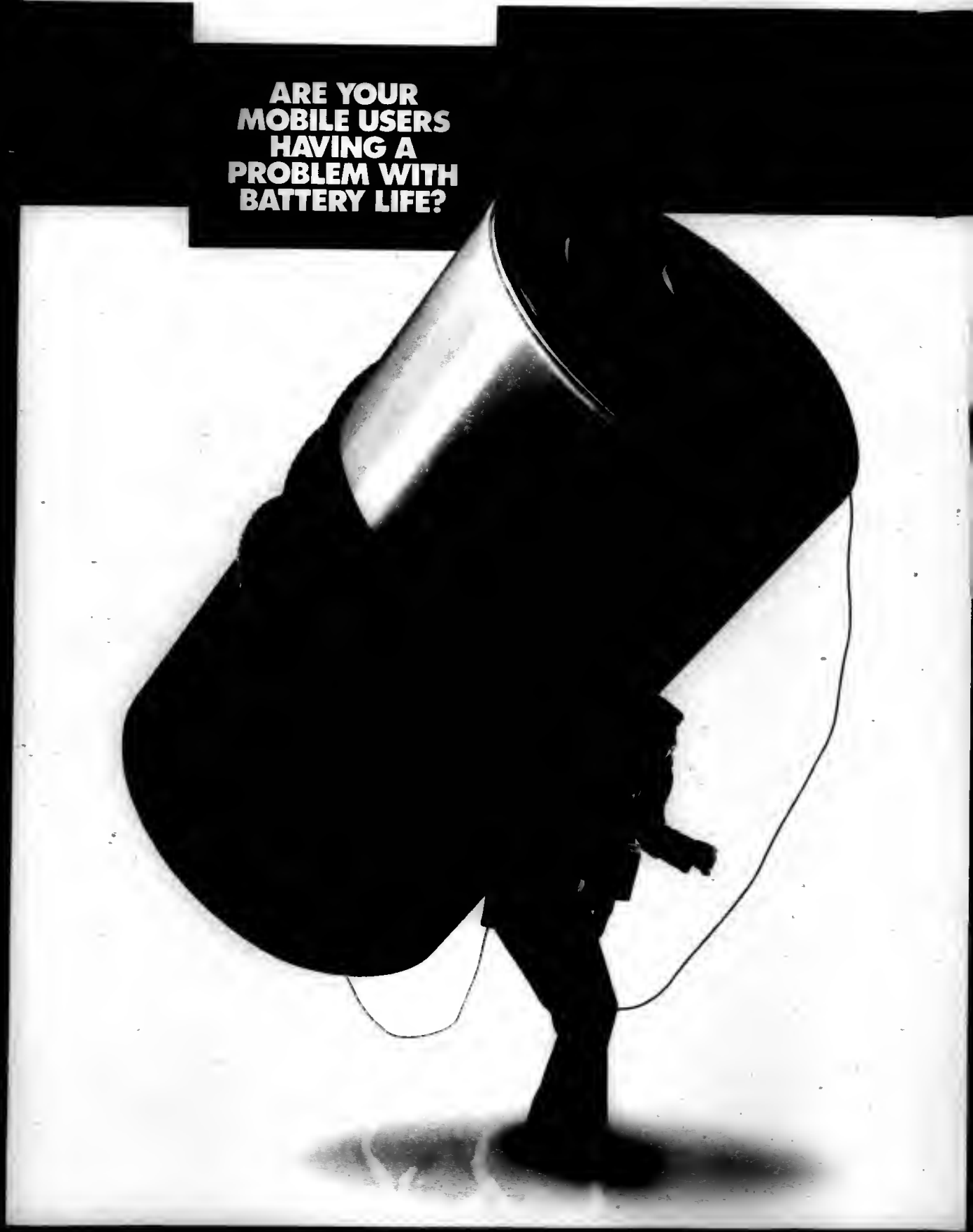
But there will be an even larger

AS/400, *page 135*

PC EXPO

The PowerPC camp will dominate the show in New York this week. Also jostling for attention will be everything from Internet gear to zippy new notebooks. See page 6.

ARE YOUR MOBILE USERS HAVING A PROBLEM WITH BATTERY LIFE?



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What's Inside

June 19, 1995

Is Microsoft out of control?

HOWARD ANDERSON: Let free competition work

You betcha, says Martin Goetz, software industry icon. And if Bill (Clinton) doesn't stop Bill (Gates), the software industry is going to collapse. Just leave the company alone, counters Howard Anderson, and let free market forces do their stuff.

See In Depth, page 106.

MARTIN GOETZ: Government must stop Microsoft

■ **Novadigm next week will** unveil Release 3.0 of its object-oriented Enterprise Desktop Manager, which now runs on Sun's Solaris and IBM's MVS. **NEWS**, *page 2*

■ **ITT will retain but redeploy** its current corps of 3,500 IS staffers as part of the conglomerate's breakup into three independent companies. **NEWS**, *page 4*

■ **An appeals court says Judge Stanley Sporkin was out of bounds** and hands the Microsoft settlement to another judge for approval. **NEWS**, *page 4*

■ **Boeing's Commercial Airplane Group** has opted to use a CORBA-compliant object request broker as the key integration technology in systems supporting a corporatewide business process redesign. **NEWS**, *page 7*

■ **Cabletron will announce an** upgrade to its Spectrum network management software today. **NEWS**, *page 8*

■ **A significant paging item** has been added to the menu: a voice paging device from Motorola that is also a portable answering machine. **NEWS**, *Page 10*

■ **Microsoft changes its technical support policies** for Windows 95 and will charge up to $35 per call for networking help, for example. **DESKTOP COMPUTING**, *page 47*

■ **FedEx is running an imaging/workflow** system that handles package delivery information and about 1.2 million signature image files a day. **WORKGROUP COMPUTING**, *page 53*

■ **Technical service and support** is fast becoming one of users' top criteria for choosing a product, and internetworking vendors are responding. **ENTERPRISE NETWORKING**, *page 61*

■ George Meng, lead product manager of **The Microsoft Network**, talks about the new business model his company is adopting for this venture and what it means for users and the industry at large. **ENTERPRISE NETWORKING**, *page 66*

■ One of the hottest topics at a Gartner Group asset management conference was the impact of **CA's pending acquisition of Legent** on Legent customers' perpetual mainframe software licenses. **LARGE SYSTEMS**, *page 77*

■ Too little user involvement and scant attention to up-front planning are two reasons why **software projects fail**. **APPLICATION DEVELOPMENT**, *page 81*

■ Every **IS project risks major problems**. Knowing how to predict and avoid them can keep the project from becoming "stressed to kill." **MANAGEMENT**, *page 87*

■ **Michael Cohn** crafts an aptitude and attitude test for job seekers. **CAREERS**, *page 112*

■ Yes, there are ways to cope with the "helpful hints" of **end users who think they have just the right deal for IS**. **MARKETPLACE**, *page 123*

■ There are many lessons to be learned from the debacle of interactive video, **Paul Gillin** says. **EDITORIAL**, *page 40*

■ Don't squelch your cybersurfers. Savvy IS staffs can exploit the Internet as a technical and business resource, **Ellis Booker** says. **VIEWPOINT**, *page 41*

■ **Michael W. McLaughlin** provides advice on how to streamline and bullet-proof the software selection process. **VIEWPOINT**, *page 41*

■ **Charles Babcock** reports that RAID has come a long way in a few years and is still advancing. **COMMENTARY**, *page 136*

KNOWLEDGE IS A TERRIBLE THING TO WASTE

In this month's Leadership Series article, Christopher Gopal and Joseph Gagnon contend that IS managers can play a leading role in the new field of knowledge management.

Following page 40.

Calendar ..... *Page 96*
Company Index ..... *Page 132*
Editorial/Letters to the editor ..... *Pages 40, 44*
June 16 Stock Ticker ..... *Page 133*
How to contact Computerworld ..... *Page 136*

Executive Briefing

Just a week has elapsed since IBM started its bid for Lotus. In this short time, the once-hostile deal has turned very friendly indeed. Lotus employees are cheering as analysts predict the merger will yield gold for customers moving to workgroup computing. *Pages 1, 14 and 36.* Separately, Lotus is expected to release a Windows 3.1 version of WordPro in July; SmartSuite for Windows 95 is also due before the end of the year, with the OS/2 version of SmartSuite slated to ship 180 days after its Windows 95 counterpart. *Page 14*

Traditional floppy disks present tremendous storage management challenges. To combat that, **Iomega** introduces a 1G-byte removable disk drive that leaves analysts bullish. *Page 2*

On the higher end of storage, EMC broadens its Symmetrix integrated Cached Disk Array product line with a set of client/server storage management systems, among other new features, and IBM adds higher-capacity disk arrays to its Ramac line. *Pages 2 and 71*

In an unusual arrangement, Radius inks a deal for IBM to manufacture Power PC-based **Power Macintoshes**, as Apple uses PC Expo as the venue to announce **Power Macintoshes based on the Peripheral Component Interconnect bus**. *Pages 28 and 47*

Oracle pays $100 million for on-line analytical processing products from Information Resources, promises to integrate **Intel's ProShare** videoconferencing software with its Media Server database by this time next year and unveils a series of **systems management** products. *Pages 12, 36 and 71*

Meanwhile, Computer Associates' Object Database partnership with Fujitsu is expected to vault it well ahead of would-be rivals such as Oracle, Informix and Sybase; **IBM's DB2 for AIX** struggles to catch up; and **Gupta** outlines plans for database and tools upgrades. *Pages 4, 12 and 16*

On the 'net: IBM announces an extensive array of Internet products, including soup-to-nuts consulting, security measures, systems integration and provisioning services, and the **tax battle begins** between revenue-hungry state governments and on-line shopping services *Pages 16 and 61*

Intergraph's object-oriented technology will let users integrate different vendors' CAD/CAM packages, and backers hope improvements to the **Eiffel object-oriented language** will help it beat out other object-oriented languages. *Pages 53 and 81*

The 5th Wave *by* Rich Tennant

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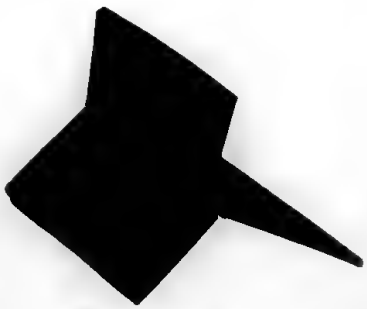

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Enhancements to Novadigm's Enterprise Desktop Manager

- Runs on Sun Solaris (previously ran only on MVS). By year's end will support HP-UX, IBM AIX, OS/2, Microsoft's Windows 95 and Windows NT.
- Allows administrators to manage multiple versions of applications.
- Extends EDM Administrator tool kit to support simulation of proposed configuration changes.

Novadigm expands platforms

By Steve Moore

Information systems managers wary of mainframe-based systems management will gain a new option next week with the launch of a Unix-based version of Novadigm, Inc.'s Enterprise Desktop Manager (EDM).

Sources close to the Mahwah, N.J., company said the object-based systems management package will run on SunSoft, Inc.'s Solaris platforms as well as IBM's MVS mainframes. EDM will also be able to synchronize and ensure interoperability among client, server and database application components. In addition, EDM will include simulation tools that allow users to assess the impact of client and server configuration changes before implementing them.

Round of applause

Users welcomed the improvements and said they looked toward forthcoming support of additional platforms.

"NT support is significant to us, and Novadigm is working on that," said Laure Dau, a technical manager at Metropolitan Life Insurance Co. The Parsippany, N.J., company has "a number of projects that are rolling out NT servers, and this tool will make that process decidedly less scary," she added.

Analysts also applauded the EDM release.

EDM provides a software asset management process so that when a new application is ready for distribution, "you can set up rules as to who gets what," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

"As a software distribution platform, EDM is turning out to be a real player," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington consultancy. Because EDM is object-oriented, it can be ported easily from platform to platform, he said.

Sources said users can expect HP-UX and IBM AIX versions of EDM to "follow rapidly" on the heels of the Solaris version, with support for IBM's OS/2 and Microsoft Corp.'s Windows NT and Windows 95 to follow by year's end.

"There is nothing comparable to EDM today in scalability, manageability and adaptability, and if you need what Novadigm has, they really do solve the systems management problem extremely effectively," Mason said.

EMC draws a bead on client/server storage

By Steve Moore

■ Large enterprises bursting at the seams with data spawned by distributed client/server applications gained an avenue of relief last week with the unveiling of a new set of high-end storage management systems from EMC Corp.

The Hopkinton, Mass., firm's Symmetrix Integrated Cached Disk Array (ICDA) line now includes the Symmetrix 3000 series, a set of client/server storage management systems that can concurrently support as many as 32 Unix servers from different vendors. The largest system supports more than 1T byte of storage.

While these capacious open storage options will not come cheap, analysts said street prices for the Symmetrix 3000 will differ radically from EMC's list prices, which range from $250,000 to $2,568,000.

"Low-end arrays are in the 50-cent to $1-a-megabyte area, but for a fault-tolerant I/O subsystem, you pay $2 per megabyte and up. And [Symmetrix] should come in somewhere in the $2 to $3 area," said Mike Peterson, president of Strategic Research Corp., a Santa Barbara, Calif., consulting firm.

He said the key aspect of EMC's announcement is, "they are saying, 'Externalize your storage from a single server, place it on a subnet like a storage network and share it as a resource between servers.'"

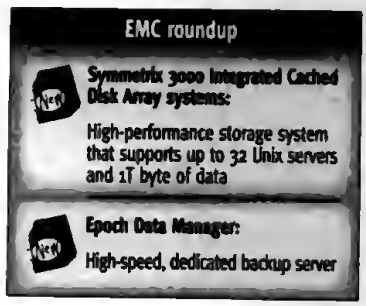
While Digital Equipment Corp. has had success with that approach in the VMS environment, EMC is unique in applying it to the client/server world — though other vendors already plan to follow suit, Peterson said.

EMC's expected move into the client/server arena [CW, May 15] has been rapid. "There is little else out there in the open storage market that can match [Symmetrix's] capacity and range of systems supported," said Fara Yale, a principal analyst at Dataquest, Inc. in San Jose, Calif.

Users applauded EMC's broad platform support, which by year's end will include concurrent support for IBM's AS/400 systems. "The real value [of the Symmetrix 3000] is that it allows you to attach different platforms to the same box," said Carter Pittman, director of systems operations at First Union National Bank of North Carolina in Charlotte.

He said First Union's strategic plan calls for platform independence as the bank ramps up client/server application deployment this year. The Symmetrix 3000 will help the bank "keep expanding our client/server environment without having to segregate it by platform," Pittman said.

Rather than attacking the low-end cost-competitive storage market, "EMC is taking a top-down approach in a market they know well — high-end applications with high storage capacity," Yale said.



Magnetic appeal

1G-byte disk drive stirs excitement

By Steve Moore

Producers and editors in the entertainment industry gained a powerful tool with Iomega Corp.'s introduction last week of a 1G-byte removable magnetic disk drive. The new 3½-in. Jaz drive is capable of storing five to eight minutes of uncompressed broadcast-quality digital video.

The drive is aimed at high-end desktop PC users, especially video production companies that need a convenient, portable medium for storing commercials and other short video clips that must be passed among several editors.

Iomega's move raises the bar for competing disk drive makers jockeying to attract computer manufacturers and end users to a new generation of high-capacity removable disk drives.

The drive received praise from users. "Optical disc drive technology is not moving quickly enough, so if Iomega does their job right, this could be a mainstream product within a couple of years," said Charles McConathy, president of ProMax, Inc., a digital video storage system developer in Los Angeles and a beta user of the Jaz drive.

Analysts said the Jaz drive is poised for widespread adoption. "The PC industry is moving through the 850M-byte point on its way to 1G byte as the average capacity of new systems sold," said Rod Watkins, an analyst at Dataquest, Inc. in San Jose, Calif.

With traditional floppy disks nearing obsolescence, Watkins noted that "at this point in time there is no installed base that [disk drive manufacturers] need to be compatible with."

A spokesman at Roy, Utah-based Iomega observed that when the Jaz drive is used to store compressed video, "you could use it like an electronic VCR and record a two-hour movie on it." The spokesman noted that Iomega is working with Promax to develop a 4G-byte array of Jaz drives that are appropriate for use with backup servers and video servers.

The Jaz drive is priced at $499, with 1G-byte disks available for $99 each.

Court ruling validates Microsoft/DOJ deal

By Mitch Betts and Stuart J. Johnston

It's over.

Giving Microsoft Corp. a 100% victory, the U.S. Court of Appeals late last week overturned a lower court's rejection of the controversial July 1994 antitrust decree between the software giant and the U.S. Department of Justice.

In so doing, the appeals court also yanked the case out of U.S. District Court Judge Stanley Sporkin's jurisdiction, handing it over to yet another judge for formal, and final, approval.

Approval of the decree removes one federal obstacle from Microsoft's path. The company still faces a Justice Department investigation into its plans to bundle the Microsoft Network into Windows 95.

"I'm sure the Justice Department is a lot more relieved than Microsoft. To [the Justice Department, Sporkin's ruling] has been a slap in the face," commented Dwight Davis, editor of "Windows Watcher" in Redmond, Wash.

In its ruling, the U.S. Court of Appeals in Washington found Sporkin's review unorthodox and said his rejection of the settlement, which covers Windows licensing practices, was riddled with judicial errors and personal bias against Microsoft.

The appeals court also said Sporkin had fixated on the "vaporware" issue and other allegations against Microsoft after he read the 1992 book *Hard Drive*. This was a key complaint of settlement supporters.

The settlement requires, among other things, that Microsoft stop forcing OEMs to pay Windows royalties for each PC they sell whether or not the PC uses Windows.

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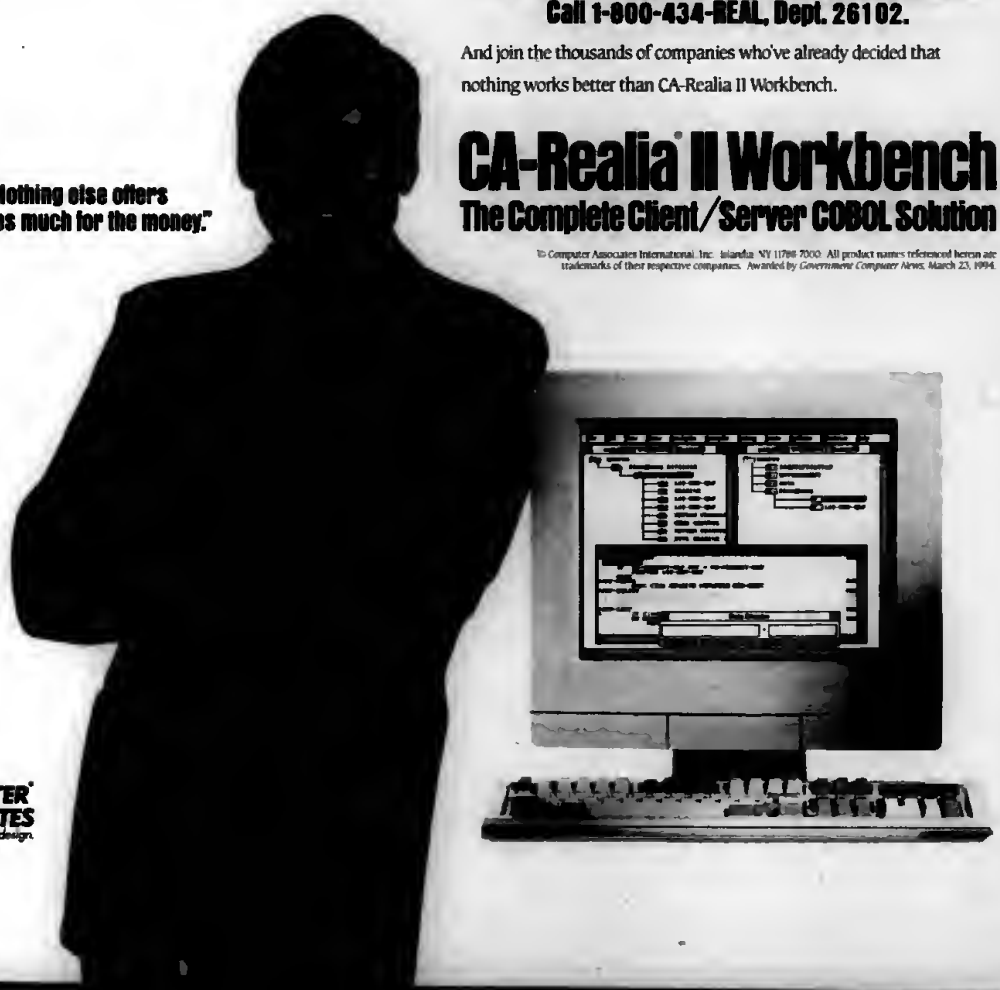

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ITT breakup sparks integration of IS

Reservation, ticketing systems to be consolidated

By Julia King

ITT Corp. may be breaking up, but the sprawling conglomerate's various information systems operations will become much more tightly integrated in the wake of last week's restructuring at the $25 billion business empire.

"One of the main reasons the company is splitting up is to create more synergies," said David H. Starr, chief information officer at ITT's new hotel and entertainment company, which will retain the ITT Corp. name.

"But there is going to be a lot more pressure on businesses because they are a lot smaller," Starr added. "We'll also see more centralization and direct management than before."

The former corporation's total IS staff of 3,500 and IS budget of about $750 million will be spread across the three new companies, Starr said.

"There will be no new downsizing initiatives," he added.

The other two new companies created out of last week's restructuring are ITT Industries, which includes manufacturers of automotive parts, defense systems and industrial pumps, and ITT Hartford, the insurance business.

Prior to the breakup, ITT comprised more than 250 brand-name companies, including Sheraton hotels and Caesar's World casinos.

Long time coming

Starr, who also heads a CIO council of IS executives from ITT's former business units, said the group has been preparing for the restructuring for at least the past year. This has included consolidating hundreds of contracts along the lines of the new companies and nailing down where computer systems might be leveraged across businesses.

It also has been systematically consolidating hundreds of contracts with various vendors to achieve cost-efficiency. Last year, for example, ITT combined dozens of small, scattered telecommunications contracts, valued at $100 million annually, and struck high-volume and highly discounted deals with AT&T Corp. and MCI Communications Corp.

The CIO council will remain intact to continue to negotiate such contracts, Starr said.

Looking ahead, Starr said he anticipates consolidating Sheraton's and Caesar's reservation systems into one. That system could also be tied into ticketing systems used by Madison Square Garden and the New York Knicks and Rangers, all of which fall under the new hotel and entertainment company.

The idea is that when a customer calls to book a hotel room, the person taking the reservation might also sell the caller tickets to a basketball or hockey game or a show at one of the casinos.

"If they have several entities that utilize central reservation services, such as casinos and hotel companies, then clearly there are huge economies of scale in merging those operations," said Victor Vesnaver, assistant vice president of Regency Systems Solutions, the Oakbrook, Ill.-based technology division of Hyatt Corp., a Sheraton rival.

The integrated reservation system, which Starr described "as something we're investigating" and "very much in its infancy," would also put callers directly in touch with a reservationist at the hotel where they want to stay. Currently, customers call a centralized 800 number.

"If you're going to Hong Kong, we want you to talk to the people in the Hong Kong hotel to make sure you get a room with a view rather than a room facing the dumpsters. With our current technology, we can't do that," Starr said.

Shakeup

ITT, a multibillion-dollar conglomerate, is breaking up into the following three independent companies:

Type of business	Number of employees	1994 revenue
ITT CORP. Hotels and entertainment	30,000	$6 billion
ITT INDUSTRIES Industrial products, including automotive parts, defense systems, industrial pumps	57,000	$7.6 billion
ITT HARTFORD Insurance	20,000	$11.1 billion

CA leapfrogs database rivals

By Thomas Hoffman, Kim S. Nash and Elizabeth Hetchler
STAFF

Computer Associates International, Inc. has grabbed the early lead in the object/relational database race.

Islandia, N.Y.-based CA last week unveiled a joint development deal with Fujitsu Ltd. that users and analysts expect will vault CA ahead of database rivals such as Informix Software, Inc., Oracle Corp. and Sybase, Inc.

By mid-1996, CA and Fujitsu plan to integrate the CA-OpenIngres relational database with Fujitsu's little-known ODB-II, an object-oriented database. The merged product, which will be called CA-OpenIngres/ODBMS, would let users search, query and manage object data — images, photographs and time-series data, for example — using relational database commands, CA said.

Users would be able to use the product in various ways: as a plain relational database, a pure object database or a hybrid relational/object product, said Marc Sokol, CA's director of product strategy.

CA also plans to support the C++ and Smalltalk object-oriented programming languages.

Fujitsu's ODB-II may not be a household name, but analysts said they were impressed.

Key differentiator

The integration of Fujitsu's ODB-II with CA-OpenIngres "blasts the straight-line object databases that don't have strong transaction control and relational capabilities," said Donald DePalma, an analyst at Forrester Research, Inc. in Cambridge, Mass. Fujitsu's ODB-II capabilities "give Ingres the differentiation in the market it desperately needs."

Plans outlined so far from Oracle, Informix and others have nothing on CA's goals, he said.

"I would love object technology in Ingres," said Dudley McFadden, a water supply engineer at the California Department of Water Resources in Sacramento.

McFadden's group collects data, both text and image, about rain and snowfall patterns. The organization, which does a lot of C++ programming, has begun experimenting with an object-oriented database from Illustra Information Technologies, Inc., McFadden said.

"But if CA can offer those capabilities, we'd really like to stick with them," he said.

Other users raised concerns about the migration gyrations they will have to make to use the technology.

Ingres customers considering the object technology may do well to wait until CA and some third-party vendors have developed a series of compatible application frameworks and class libraries that are forthcoming, said Shaku Atre, president of Atre Associates, Inc., a Port Chester, N.Y., consultancy.

CA-Ingres 6.4 shops must upgrade to CA-OpenIngres to take advantage of any object orientation that CA and Fujitsu plan to add during the next 12 months, Sokol confirmed.

However, CA-OpenIngres is not an option for some users, at least not any time soon. For example, the Fred Hutchinson Cancer Research Center in Seattle just finished upgrading to CA-Ingres 6.4 in March.

"That was a huge job, so we're not eager to make another big change, even if the [object] technology looks good," said Caroline McKallor, a database administrator at the medical facility.

Other users, though, saw the swap as necessary for keeping up with technological advances.

Objects of desire

CA's delivery plans for CA-OpenIngres and CA-OpenIngres/ODBMS

CA-OpenIngres 1.1	Will ship later this week on more than 10 Unix platforms, including Hewlett-Packard's HP-UX, IBM's AIX and Sun Microsystems' Solaris.
CA-OpenIngres 2.0	Scheduled to enter beta testing in the fourth quarter; will be compatible with Microsoft's OLE technology.
CA-OpenIngres/ ODBMS system development tool kit	Will be delivered to customers by year's end. A fully integrated object/relational database will reach general availability by next June. More details will be unveiled at CA's worldwide user conference July 16-21 in New Orleans.

Corrections

"PC vendors acquiesce to ship Win 95" [CW, June 12] incorrectly stated that all of the PC hardware vendors on a list provided by Microsoft have licensed Windows 95. The company claims that 45 OEMs have indeed licensed Windows 95, but it now says the firms on the list have only "committed" to shipping Windows 95 — some have not yet signed licenses although all plan to ship it.

Due to a reporting error, "Voracious CA gobbles up Legent" [CW, May 29] incorrectly stated two Legent product names. XPE stands for Cross Platform Environment. The correct name of Legent's communications software is Mlink. Also, XPE does not contain any object-oriented tools.

In the photos accompanying "Celebrating the global reach of technology" [CW, June 12], Geri DiCostanzo and Joseph Kubat were incorrectly associated with Science Applications International Corp. (SAIC). Both are with Security Industry Automation Corp. (SIAC).

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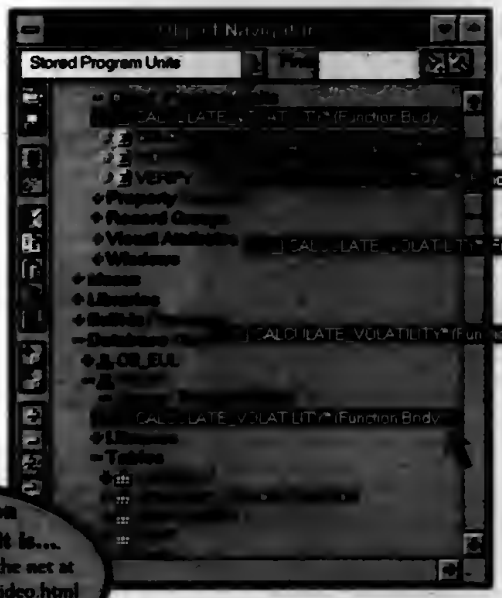

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Redefining Productivity

PC competition rages fiercely

Hardware initiatives take center stage alongside OpenDoc revival at show

By *Computerworld* staff

It may look like the old days have returned this week at PC Expo in New York, when smiling executives from IBM and Microsoft Corp. appear on stage together at the launch of IBM's PowerPCs.

But looks can be deceiving. The companies are competing more fiercely than ever (see related story, page 1). Following is a whirlwind tour through some of the areas where new products will surface at the show:

PowerPC

Watch out for a big splash from the PowerPC camp. After many months of speculation, IBM will finally unveil its long-awaited PowerSeries 800 line of desktop systems and ThinkPad PowerSeries notebooks. The line is well behind schedule.

Heavily packed with multimedia features, the systems are based on the PowerPC 601, 603E and 604 processors. They will run Microsoft's Windows NT and IBM's AIX operating system. OS/2 for the PowerPC will be available only in beta versions.

From the **Microsoft** corner, the latest update of Windows NT, Version 3.51, will add support for IBM's PowerPC lineup to its long list of supported hardware platforms. For its part, IBM will announce that its AIX for the PowerPC is ready. A beta version of OS/2 will also be available.

Microsoft's Windows NT

Citrix Systems, Inc. in Coral Springs, Fla., will announce a Windows NT product that uses its Intelligent Console Architecture (ICA3) to provide high-speed, remote multiuser access to Windows NT servers.

Cheyenne Software, Inc. in Roslyn Heights, N.Y., will announce Windows NT backup products, PowerPC support, automatic configuration software and an alliance with Houston-based Compaq Computer Corp.

Also trying to make a big impression will be **Canon, Inc.** The Windows NT-based Canon Power Workstation line will include a notebook series as well as uni- and dual-processor desktops based on the PowerPC 604 and 603E processors. Products are expected to start shipping in August.

Zenith Data Systems, IPC Technologies, Inc., Tatung Science and Technology, Inc. and **FirePower Systems, Inc.** are also expected to announce products at the show.

Internet products

IBM will demonstrate the next release of WebExplorer, the object-oriented browser bundled with OS/2 Warp. The latest OS/2 edition will feature drag-and-drop capabilities for dragging images or World-Wide Web addresses into the desktop or a folder.

IBM plans a device driver permitting Web browser access into the OS/400 operating system for the AS/400 in the first half of next year.

Digital today will add a detachable multimedia *module to its HiNote Ultra notebook computer. The CD-ROM drive adds one inch to the height and two pounds to the weight of the four-pound HiNote Ultra. It also lightens the wallet by $899. Analysts said Digital is taking an interesting approach by making the CD-ROM drive and stereo speakers completely detachable, so business travelers have the option of bringing the multimedia capability or leaving it at home or in the hotel.*

In the legacy-to-Internet connectivity space, IBM last week announced CICS Internet gateway, DB2 WWW Connection and — for IBM MQSeries messaging software — the MQSeries Internet gateway. IBM's OS/2 and AIX Web servers are available now at $799 and $1,499, respectively.

Starting this week, the beta code for DB2 WWW Connection for OS/2 and AIX will be available for downloading at IBM's Web site (http://www.torolab.ibm.com); a preview of the CICS Internet gateway is also available (http://www.hursley.ibm.com).

PC hardware

Hewlett-Packard Co. will show off its latest NetServer LS series of servers based on the 133-MHz chip. The systems, which can scale up to four processors, feature dual Peripheral Component Interconnect (PCI) buses, up to five PCI expansion slots and dual integrated PCI fast and wide SCSI-2 controllers for increased I/O performance, according to the Palo Alto, Calif., company.

Also making a big splash will be **Digital Equipment Corp.** with its announcement of new products across its entire commercial lineup. This includes symmetrical multiprocessing servers, desktop PCs and notebooks based on a wide variety of Intel Corp. Pentium processors.

Meanwhile, in the **Intel** space, a raft of vendors is expected to demonstrate systems based on the recently announced 133-MHz Pentium chip. More than 50 vendors have already announced their intention to release systems based on the chip in the next couple of months.

Compaq will showcase its new lineup of DeskPro XL PCs based on Intel's 120-MHz chip. Models of the 120-MHz DeskPro XL will come with standard 16M-byte RAM, 1G-byte SCSI hard drive, 256K-byte secondary cache and PCI local bus architectures. The company's new flagship commercial systems will start at $3,950. Compaq is also expected to demonstrate PCs and servers based on the new 133-MHz chip.

Meanwhile, **Zenith Data** will also demonstrate an Intel-based midsize PC server. The Z-Server MX is dual-processor capable and based on the 75-MHz and 90-MHz Pentium chips. It comes with features fast becoming standard fare in this class of systems: integrated, fast and wide SCSI interfaces for disk, RAID and optical storage, error checking and correcting memory. The systems, which have already started shipping, will cost $7,452.

Portables and notebooks

Compaq will show off its latest Contura 400 family of value notebooks. The series, which starts at just more than $2,500, will be available in both 75-MHz DX4 and 100-MHz DX4 models. Compaq's series is among the few in its class to offer systems based on the 100-MHz DX4 chip.

Also expected to garner its share of its attention at PC Expo is **IBM**'s popular Butterfly — the ThinkPad 701 series, on which the company knocked back prices by up to 17% last week. The Butterfly will now start at $3,199, down from its original entry price of $3,799.

The notebook, with its unique expandable keyboard, was launched in March and has been in short supply since. In a bid to meet demand for the product, IBM last week announced it will begin to manufacture the product at its facilities in Guadalajara, Mexico.

Toshiba America Information Systems, Inc. will take the wraps off the Satellite Pro 400 Series, incorporating a Pentium 75-MHz processor, lithium ion battery and infrared wireless communication technology. Available in two models, the Satellite Pro 400 series comes with a new modular options slot called SelectBay, which allows users to interchange a floppy disk drive with a quad-speed CD-ROM. A model with an active-matrix color display starts at $4,899 and includes 8M bytes of RAM and a 770M-byte hard disk. The systems are expected to start shipping in July.

PC and database software

Microsoft's much-anticipated SQL Server 6.0 database is expected to hit the street, squeaking in just under a promised first-half 1995 shipping date.

The upgrade will sport graphical administration tools designed to simplify the monitoring and fixing of SQL Server databases. SQL Server 6.0 will also be able to run on hardware with up to eight processors and replicate — or copy and synchronize — databases at different sites, Microsoft said. Pricing is $1,000 per server; clients are $149 each in purchases of 20 or more.

Microsoft will also show several other products that are due to ship by July 1, including Visual FoxPro [CW, June 5].

FileNet Corp. and **Novell, Inc.** will announce that FileNet's imaging and workflow software will be included in Novell's next version of GroupWise.

Application development tools

Show attendees can also check out the OpenDoc pavilion sponsored by **IBM, Apple Computer, Inc.** and **Novell.** The pavilion will feature 15 developers demonstrating work-in-progress OpenDoc-based applications, most of which will ship by the end of the year.

An early version of a development tool that is IBM's planned riposte to Microsoft's Visual Basic will be previewed in demonstrations at the company's PC Expo booth. The technology, which is code-named Denali, will allow developers to work with Visual Basic applications and custom controls. It will also let users build OpenDoc components. Developers will be able to compile software built with the tool to run on OS/2 or MacOS operating systems, according to IBM.

Boeing unit takes object path in redesign

By Elizabeth Heichler

In a ringing endorsement of object technology, The Boeing Co.'s Commercial Airplane Group has decided to use a standards-compliant object request broker as the integration linchpin in a massive migration to off-the-shelf client/server systems.

The systems will be deployed to roughly 45,000 users by the end of 1997. The new applications will support the division's entire business, including manufacturing, procurement, finance and sales.

"Boeing is taking a big step here and creating a new foundation," said Ron Trout, manager of systems integration at the Commercial Airplane Group in Puget Sound, Wash.

Unix rules

Boeing Commercial Airplane Group's client/server system will be almost completely Unix-based, with Hewlett-Packard Co. application servers and Sequent Computer Systems, Inc. database servers on the back end and X Window System software delivering Unix application interfaces on desktop PCs.

The group is in the midst of a complete business process re-engineering effort, during which it realized that its legacy systems could not adequately support the redesigned processes, Trout explained. The Commercial Airplane Group is Boeing's largest division, accounting for more than half of its 113,000 employees and $16.8 billion of last year's total revenue of $21.9 billion.

As part of this project, Boeing is moving away from its traditional practice of building homegrown systems to support each new airplane project. Instead, it has selected a group of off-the-shelf commercial software packages. These packages will be integrated using Iona Ltd.'s Orbix, which complies with the Common Object Request Broker Architecture (CORBA) standard.

Almost there

CORBA-compliant object request brokers such as Orbix manage the communications between object-oriented applications distributed over a network. While all of the commercial applications chosen by the group are moving toward object-orientation, not all are there yet. So the Commercial Airplane Group will provide a migration path in the meantime by writing special function calls to the object request broker, said J. P. Gordon, a consultant working on-site.

While there was concern at Boeing that CORBA technology is still immature, Trout and his colleagues determined that it is stable enough to meet their current needs. "We're having to reach into new technologies because this is a multi-year project, and the systems will be here for a decade," Trout said.

Boeing also felt strongly that going with an object-oriented approach to integration was more in sync with the company's strategic technical direction than using alternative approaches such as message-oriented middleware or remote procedure call technology, Gordon said. "Objects let us reflect the business processes more closely in systems," he explained.

Boeing plans to use the object request broker in an area where the technology has proved itself, said John Rymer, vice president of Patricia Seybold Group in Boston.

Object request brokers offer an integration mechanism that has the advantage of working outside of the application itself, rather than requiring developers to delve into applications' source code and change it, Rymer added.

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Cabletron upgrades Spectrum

By Patrick Dryden

Cabletron Systems, Inc. will upgrade its enterprise network management software this week, expanding internetworking devices monitored and the number of platforms supported by its Spectrum console.

Administrators will be able to run the distributed manager from Hewlett-Packard Co.'s HP-UX and from other major Unix versions. That is a major boost because HP holds about 20% of the workstation market, Cabletron officials said last week. They said they still expect to release a version for Microsoft Corp.'s Windows NT in the fourth quarter.

Current users may be happier to get new and updated modules that manage their hubs, switches and routers in Spectrum 3.1.

"We need to keep up with upgrades by Cisco Systems," said Drew Davis, network services manager at Boehringer Mannheim Corp., an Indianapolis-based pharmaceutical manufacturer.

"As for more platforms, we're set on Sun Microsystems' workstations now," Davis said. "But it will be nice when Spectrum 4.0 comes out to cut some $50,000 workstations from our budget by running it on Windows NT for some managers."

Peaceful times
Gartner Group forecasts that the enterprise network management wars will end within the next 12 to 18 months, when 70% of major companies adopt a console by Cabletron, HP, IBM or Sun.

Cabletron is clearing some individual client requests with this release, said Brad Hecht, an analyst at Gartner Group, Inc. in Stamford, Conn. More significant is the effort to promote Spectrum as a worthy individual product — rather than an enhancement to Cabletron hardware — that comes with extensive support and capabilities, he said.

"Cabletron is at least 12 months ahead of competitors in the distributed scalability of Spectrum," Hecht said. "It's vital they capitalize on that now because major corporations are in the beta-test process with several enterprise network managers."

Added support for HP-UX could entice HP OpenView users who will not wait for the distributed Toroado version promised for delivery next year, said Patricia Chrystycz, director of network management marketing at Cabletron in Rochester, N.H.

New in Spectrum 3.1 are more than a dozen modules that manage vendors' proprietary Management Information Base agents via the Simple Network Management Protocol. Supported devices include products from 3Com Corp., Bay Networks, Inc., Cisco, Fore Systems, Inc., Hughes LAN Systems, Inc., UB Networks, Inc. and Retix.

Spectrum 3.1 will ship as an automatic upgrade in July. Pricing for the server and console software starts at $15,000.

Internetworking vendors respond to demands for better service. See page 61.

Look who's watching

Network monitoring via an Internet browser will expand Spectrum's reporting options when Version 4.0 comes out late this year, Cabletron officials said last week.

The distributed enterprise network management software will be able to send collected information to home pages on internal servers linked to the World-Wide Web. Authorized staff can then monitor statistics from any networked or modem-equipped system running browser software.

This capability makes management information directly available to more personnel, said Patricia Chrystycz, director of network management marketing at Cabletron.

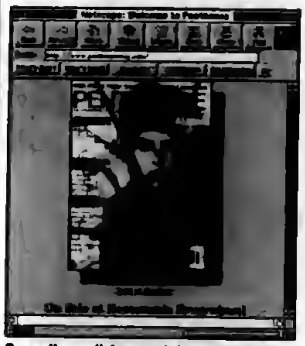
"Administrators want to automate the creation of reports that their management can call up from their desktops without having a Unix platform and experience," Chrystycz said. "Then management can get actual information about network performance to consider staffing issues, for example, or discover who may be hiding embarrassing event statistics like uptime on individual hubs or routers." —*Patrick Dryden*

Senate votes to ban on-line obscenity

By Mitch Betts
WASHINGTON

U.S. Sen. Patrick J. Leahy (D-Vt.) held up a foot-high petition with 35,000 signatures from free speech advocates on the Internet, but that was not enough to stop Senate passage of a politically popular measure to outlaw pornography on computer networks.

The Communications Decency Act, approved by an 84-16 vote as an amendment to telecommunications reform legislation, would cover traffic on the Internet, commercial on-line services and computer bulletin boards. It would ban the on-line transmission of sexually explicit and "filthy" materials that could be accessed by people under age 18.



Sexually explicit material *may be banned from on-line services if the House agrees with the Senate vote*

But the legislation's future is uncertain. In the U.S. House of Representatives, the companion bill calls for only a U.S. Department of Justice study of legal and technical approaches to controlling on-line obscenity.

Washington-area lobby groups such as the Interactive Services Association, the Business Software Alliance and the Center for Democracy and Technology would prefer a technical fix. "Smut filters" are now emerging to give parents more control, they noted.

For example, SurfWatch Software, Inc. in Los Altos, Calif., recently announced PC software that blocks access to pornographic sites on the Internet [CW, May 22].

Last week, Microsoft Corp., Netscape Communications, Inc. and Progressive Networks, Inc. vowed to create a rating system and industry-standard filter by next year.

News Shorts

Senate passes giant telecom reform bill

The U.S. Senate last week voted 81-18 to overhaul the Communications Act of 1934 and allow more competition between local telephone companies, long-distance carriers and cable TV companies. The bill permits firms such as **AT&T Corp., MCI Communications Corp.** and cable TV companies to compete in the local exchange market, which is good news for business network managers upset by the regional Bell operating companies' continued monopoly over the local loop. An amendment backed by the **International Communications Association**, a major user group, also put some limits on the price flexibility given to the Bell companies. Action in the U.S. House of Representatives is expected next month.

Windows 95 interface ships

A Microsoft Corp. official said the company will ship an early version of the Windows 95 interface for Windows NT 3.51 to some users this month. The code will be on the latest release of the Microsoft Developers Network CD-ROM.

Early bird gets the objects

SunSoft, Inc. in Mountain View, Calif., last week said it has shipped beta copies of its Distributed Objects Environment development kit to 100 early access customers. Developers can use the beta software to create objects and runtime environments for the Solaris operating system. But users must wait for Sun's delayed OpenStep user interface, due next year, before they put applications into production, SunSoft said.

Oracle outlines warehousing

After keeping mum on its data warehousing plans while competitors touted their strategies, **Oracle Corp.** plans to outline its own vision this week. The Redwood Shores, Calif., vendor is expected to unveil special consulting and bundling deals for warehouse users as well as talk about how it will digest its acquisition last week of IRI Software (see story, page 36).

Ethernet standard gets OK

The **Institute of Electrical and Electronics Engineers** last week approved the 100M bit/sec. or "fast" version of Ethernet, the most popular LAN link with more than 60 million nodes installed worldwide. The 100Base-T specification, already implemented by many adapter, hub and switch vendors, should appear in more products now that it has official sanction as the IEEE 802.3u standard.

ARDIS cuts airtime rates

ARDIS, a wireless data communications network, has announced reductions in airtime rates as a way to encourage developers to produce new wireless applications. ARDIS will cap airtime costs for developers at $40 per month per development hardware unit and has established a rebate program for developers of applications that pass the network's certification test.

Merger makes credit bureau

First Data Corp. in Hackensack, N.J., and **First Financial Management Corp.** in Atlanta will merge, creating the country's largest processor of credit-card and other financial payment transactions. The combined business, which will operate under First Data's name, will employ 37,000 people and garner revenue of about $4 billion.

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Motorola's pager picks up when you don't

Device stores four minutes of voice messages

By Mindy Blodgett

For users who can't live without their pagers, there is a new twist: a voice paging device that will also function as a portable, wireless answering machine.

The device, called Tenor, is due to be announced by Motorola, Inc. this week. It is expected to hit the market early next year and will be available through Page Network, Inc. (PageNet) in Dallas on its VoiceNow narrowband personal communications service (NPCS). The palm-size device will be small enough to carry on a belt or store in a purse or briefcase.

Tenor, which uses Motorola's Inflexion high-speed voice and data protocol, is a significant addition to the paging market, according to Roberta Wiggins, an analyst at The Yankee Group in Boston. But she said it is not yet clear whether business users will clamor for a voice paging product.

"It's questionable how much of a corporate need there will be," Wiggins said. "However, there are many executives who are very comfortable with voice communication. What could be simpler?"

Motorola's Tenor *is expected to hit the market early next year*

According to Sandra Humphrey, marketing director at Motorola in Schaumburg, Ill., the Inflexion protocol digitally compresses voice communications and stores up to four minutes of messages. Tenor will not allow the user to acknowledge messages, but technically the system is two-way; it has a special geographic locator that must find the user before sending the message and that then informs the system when the message has been received.

Paging proliferation

Some industry observers predict that by the year 2000, there will be approximately 55 million traditional paging and NPCS users. NPCS technology allows two-way paging as well as data transmission.

Inflexion uses only one transmitter to send the message to the pager. Until now, carriers have found voice paging to be a "spectrum hog" because it uses too much bandwidth, Humphrey said.

Normally, a page goes out and is picked up by all transmitters before it is sorted out and sent off to the device, hogging spectrum time. But Inflexion has a special locator that sends a short signal to locate the device's geographic zone and then determines the optimal and nearest transmitter — a much more efficient method, Humphrey maintained.

The infrastructure for the new technology is now being constructed and should be ready by the time the pager starts testing this fall.

Tenor will provide only voice communication, with data to follow. When the data capability is added, it will allow transmission speeds of up to 112K bit/sec., according to Larry Conlee, a Motorola vice president.

Once the device is deployed, PageNet and Motorola have an exclusive partnership agreement for six months. Conlee said, however, that Motorola is talking with other NPCS carriers interested in marketing the product as well.

A PageNet spokesman said the product will be leased for $20 per month. The company also plans to sell it to customers but did not disclose pricing.

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Videoconferencing link may cut costs

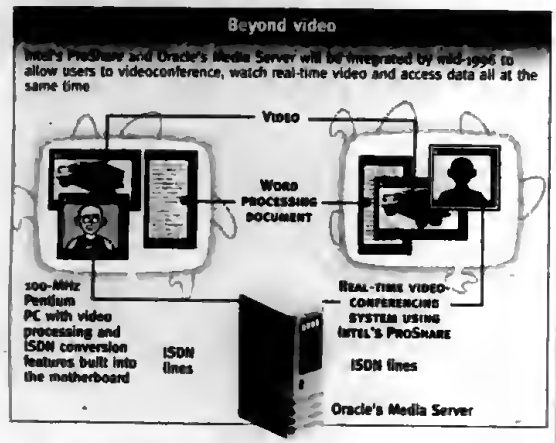
By Kim S. Nash and Jaikumar Vijayan

Intel Corp. and Oracle Corp. got interactive last week. At least the companies' respective chief executive officers did, promising to integrate Intel's ProShare videoconferencing software into Oracle's Media Server database by this time next year.

The project's goal is to lower the cost and improve the capabilities of PC-based interactive video applications by sending them over existing Integrated Services Digital Network (ISDN) phone lines (see illustration). Competing desktop video technology optimally requires higher and more expensive bandwidth, such as Asynchronous Transfer Mode.

Beta tests of the integrated Oracle Media Server and Intel ProShare conferencing software are slated for the next quarter, but Intel and Oracle are the only sites scheduled so far to test the products, an Oracle spokeswoman said.

The vendors "have formed a way to bring a part of the information highway into reality," said Larry Fong, an analyst at Southcoast Capital Corp., a brokerage firm in Austin, Texas.



For example, Starbucks Corp., a popular coffee franchise with headquarters in Seattle, is building a set of PC-based video applications for employee training using ProShare and the Oracle7 database.

Such a system could also connect users to related video, audio and text information collected and stored on Oracle's Media Server database. Oracle CEO Larry Ellison and Intel CEO Andy Grove last week demonstrated real-time videoconferencing and video electronic mail.

Inferior technology?

Still, there are technology issues to overcome, some observers said.

The 18-month-old ProShare is, in some ways, inferior to other video technology, such as products based on the Motion Picture Experts Group (MPEG) compression standard, said Linley Gwennap, editor of "Microprocessor Report," a newsletter in Sebastopol, Calif.

And that could seriously limit how far and fast the integrated Oracle/Intel products can go, Gwennap said.

For example, while ProShare allows video to be pumped out through standard ISDN lines — and is therefore cheaper than MPEG, which requires a much higher bandwidth — the jumpy picture and audio quality make ProShare unsuitable for much more than basic videoconferencing, Gwennap said.

However, Grove claimed that ProShare is installed at 2,000 customer sites. And with the ability to store and retrieve video and audio data that Oracle Media Server was designed to provide, he predicted there would be "mass deployment."

Another problem is that ISDN is far from pervasive. ISDN connections cover roughly 60% of the U.S.

While Grove said this deal does not negate an earlier pledge from Intel to support Microsoft Corp.'s planned on-line service, Microsoft is apparently moving too slowly for Intel. "Oracle is far more ready to implement this than anyone else," Grove said.

TV, PCs take step closer

Idle portion of TV signal used to download software

By Tim Ouellette

Like a prophet of old, Eo Technology Corp.'s Malachi hopes to reach the masses by the end of the year.

Malachi is the code name for a PC board with software and a video cable that links a PC to a television. Malachi lets PCs receive data sent via TV signals, and analysts said they expect its most popular business use will be to distribute PC software.

With Malachi, broadcasters can transmit data right alongside the TV show they are beaming out at the time. The data actually occupies the vertical blank interval (VBI), which is the nonvisible portion of the TV signal currently used only for closed-captioning.

"I'm sure it started out life as a solution in search of a problem" because people have been looking for ways to use the extra space in the VBI, said Emily Green, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

The data can include multimedia versions of newspapers and magazines, catalogs of software or marketing materials. Users can also tape shows on a VCR, then download the accompanying data when playing back the tape.

"As far as I'm concerned, the most interesting thing they can do is they can distribute software," said Brian O'Connell, an analyst at Technologic Partners in New York.

To further this end, Keene, N.H.-based En Technology wants to ink agreements with hardware vendors to bundle Malachi on PCs. En Technology is also trying to sign distribution deals with software companies. No deals have been announced.

And though it would seem the Internet is a viable alternative for downloading software, En Technology Chief Executive Officer David Hall said Malachi takes minutes to download something that would take an hour over a regular modem connection. Larger applications would require transfer across part of the visible signal, however.

Beta tests have been run at TV stations in Manchester, N.H., Atlanta, Boston, Baltimore and Las Vegas.

Malachi, which will cost $100, is expected to ship in the fall.

Users await tools for Unix DB2

By Craig Stedman

ORLANDO, FLA.

Several database managers at a DB2 conference here last week complained that a lack of third-party management tools and utilities limits the usefulness of the Unix version of IBM's relational database. But their SOS call will not be answered for at least another six months.

Platinum Technology, Inc. in Oakbrook Terrace, Ill., and BMC Software, Inc. in Houston, two of the key vendors of mainframe DB2 utilities, said Unix-based DB2 remains below the market-leading databases from Oracle Corp. and Sybase, Inc. on their priority lists. DB2 will not move up until IBM sells enough copies to justify the investment, they added. Thus far, IBM claims just 1,000 server licenses for the database.

But without better management tools, DB2 for AIX will have muted appeal even after a long-awaited second version ships in late July, said users attending the International DB2 Users Group's annual North American conference. AIX is IBM's Unix operating system.

"It's a chicken-and-egg kind of thing," said Marion Rudman, a senior systems software programmer at Allstate Insurance Co. in Northbrook, Ill. "Real tools are going to be available when there are a lot of users. The [third-party] vendors have to go where they see a market."

Today, managing DB2 for AIX "has to be done pretty much manually" through IBM's Rexx programming language or Unix shell scripts, Rudman said. Allstate wants more robust change management tools and utilities for doing loads, backups and recovery, he added.

The quality of management tools is the main difference between mainframe DB2 and Unix DB2, said J. Gregory Carroll, director of data resource management at Sears Canada, Inc. in North York, Ontario. "DB2 on MVS is very mature in that fashion. That's not the circumstance with DB2 for AIX."

A user at a large DB2 shop who asked not to be identified said she has to be able to manage the MVS and AIX versions from a single console to keep costs down. Widespread use of DB2 for AIX is difficult "without the same kind tools we're used to on the mainframe," she added.

On the way

IBM's client/server versions of DB2 include the following:

Product	Ship date
DB2 2.1 for AIX and OS/2 (new version)	Late July
DB2 2.1 for HP-UX, Solaris and Windows NT (non-IBM platforms)	Beta release in late July; shipment in fourth quarter
DataHub for Unix (administration tools)	August
DB2 2.1.1 for AIX and OS/2 (bug fix release)	Late fall

Get serious

Janet Perna, director of database technology at IBM's software lab in Toronto, acknowledged that tool vendors are sitting on the sidelines. "They want to know that we're serious and that we're going to be successful," she said.

To make it more feasible for tool vendors to embrace DB2 for AIX, Version 2 includes required programming interfaces that did not make the first release, Perna said. IBM also is lobbying application vendors to support the database and thus spur end-user demand, she added. SAP AG and PeopleSoft, Inc. have already announced plans to hook their software into DB2 for AIX.

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Future of Lotus' projects in question

Industry ponders fate of AT&T Network Notes, InterNotes

By Suruchi Mohan

Last week's handshake between IBM Chairman Louis V. Gerstner and Lotus Chairman Jim Manzi signaled the beginning of a new era in desktop software — one that many hope will bring heightened competition to software giant Microsoft Corp.

At the same time it brought sighs of relief from users and Lotus employees fearful of the impact of a hostile takeover.

"It's beginning to look a little better," said John Hodge, chief information officer at NAC Reinsurance Corp. in Greenwich, Conn. He said he was pleased with the news because it means additional financing and marketing acumen, which Lotus "definitely" needs. "My primary concern was that as a hostile takeover, it was not a great way of getting together with the people who will be critical for [IBM's] business," he said.

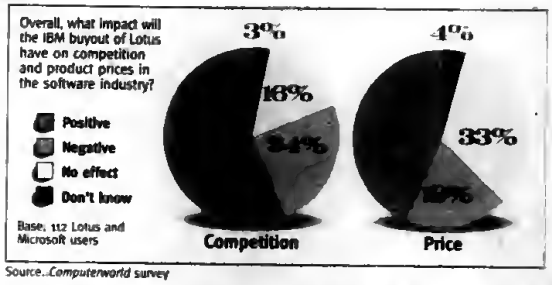
The industry's largest software buyout also ignited rampant speculation about the future of Lotus products, projects and relationships.

"Lotus has good products [and] direction, and if that momentum is maintained, [the acquisition] is a plus," said Charlie Paulk, CIO at Andersen Consulting in Chicago. "If IBM takes the products and becomes proprietary, it will be a big negative."

Now that Lotus has surrendered to IBM's financial might, users have turned their attention to the fate of various projects (see story page 36). In addition to the company's application suite, two other areas of interest emerged last week: Lotus' partnership with AT&T Corp. and its Internet plans.

For example, the industry has seen much speculation about the fate of AT&T Network Notes. A source close to IBM said the company has told key Lotus partners, such as AT&T, that it is committed to maintaining relationships. But signing deals with other public carriers "probably wouldn't be something that's out of the realm of possibilities. IBM wants to make Notes ubiquitous. They don't want to close it off," the source said.

If that happens, AT&T could lose its most-favored-company status. An AT&T spokesman said the company is "remaining committed to the development and implementation of AT&T Network Notes, and the acquisition doesn't change that."



Source: Computerworld survey

Apart from AT&T, Lotus has other big partners, such as Hewlett-Packard Co. and Oracle Corp., which compete with IBM. "HP has de-emphasized its messaging software to become an integrator for Notes," said David Marshak, a vice president at Patricia Seybold Group in Boston. "Suddenly the role [of maintaining relationships] falls to IBM. Small partners are pleased with their relationship with Lotus. Now [they have to] re-establish with IBM, and it's very different," he said.

On the Internet

Users are also interested in InterNotes, Lotus' family of Internet products. But the future looks bright, said Reed Sturtevant, director of product marketing of InterNotes at Lotus in Cambridge, Mass. "IBM has a set of complementary products and a lot of interest in the Internet and the Web. An integrated product line on the server side is a key customer demand."

This was good news to a user at a large consulting firm, who said IBM's approach to the Internet was half-hearted. "Now they have a wonderful tool in their hands. We'll see what they'll do with it," said the user, who asked to remain anonymous.

"There are a lot of imponderables right now. The best-case scenario is that IBM keeps its hands off Lotus, provides more capital and attracts developer talent. The worst-case scenario is that IBM buries Notes and ties it to an IBM proprietary platform," said Richard Kesner, CIO at Babson College in Wellesley, Mass., which was one of the first large sites to deploy Notes. "If that happens, IBM could lose us as a Notes customer," he said.

Senior editors Jean S. Bozman, Laura DiDio and Craig Stedman contributed to this story.

Around the watercooler

Inside Lotus last week, employees at all levels were clearly starting to relax.

Although asked to refrain from making public comments, Lotus employees still talked enthusiastically about having more money poured into their dwindling coffers.

"This will give us an opportunity to be more flexible in decision-making from quarter to quarter," said one employee, explaining that he will not be required to show an immediate return on investment on his projects when Lotus becomes a division of a larger company.

Another employee agreed, saying, "We will be able to make a bigger impact on the market because of more resources. There will be lots of funds for advertising."

However, some employees did sound a note of caution. "If they let us be autonomous, it will be great. [But it remains] to be seen what time will bring," said one. —*Suruchi Mohan*

IBM agrees to keep Lotus independent

Desktop applications business a weapon against Microsoft

By Lisa Picarille

Now that the deal is done, speculation abounds that IBM will dump Lotus Development Corp.'s desktop applications or force its new partner to develop only for OS/2.

But Lotus officials last week claimed their $500 million desktop applications business is a lucrative and valuable weapon against Microsoft Corp.

"The desktop business is clearly what IBM is also buying," said Jeff Anderholm, Lotus' director of spreadsheet marketing. The Cambridge, Mass.-based software developer's desktop arsenal includes the WordPro word processor, its popular 1-2-3 spreadsheet, the Freelance graphics package, the Organizor personal information manager and the Approach database. These products are also bundled together in SmartSuite.

Briefings last week at Lotus made clear that the company sees tight integration between its application suite and Notes as a key selling point and competitive advantage. In addition, Lotus also offers a grouping of 10 applications, called NotesSuite, meant to be used with Notes.

Indeed, IBM seems to be in agreement. John M. Thompson, IBM senior vice president and group executive, emphasized that an acquired Lotus would "absolutely" keep developing applications. When asked if IBM would meddle with Lotus' NT or Windows 95 development plans, he said, "That's not going to happen."

Hands-off approach

Emphasizing that IBM wants to keep its hands off the company's development efforts, he added, "Lotus is the expert in groupware, and they're the experts on the desktop. The last thing I want to do is tell them what to do."

Thompson added, "The beauty of Notes is that it runs on all the different [operating system] worlds we needed. We will absolutely keep it independent."

"People within Lotus are quite excited that we have a sound strategy with IBM support, especially [their] enterprise support, [and now] there is a sound basis for [user] evaluation of our products vs. Microsoft," Anderholm said.

Users said the combined IBM/Lotus entity now has the products along with the clout and cash to give Microsoft some added competition.

"It gives [IBM] the whole package so that they can now have a competitive product head to head with Microsoft in every area and to go in some areas Microsoft can't," said Jeff Held, a partner at Ernst & Young's Technology Services Practice in New York, a huge Notes site that also uses Microsoft's Office suite of applications.

Wait and see

Allen Carney, vice president of desktop marketing at Lotus, said although "it's a little early" to know what IBM has in store for Lotus' desktop products, the company remains committed to delivering products on a variety of platforms.

However, Lotus indicated that a Power Macintosh server version of Notes is not one of them.

"We have to be a strong Windows player," Carney said. "The importance of OS/2 to Lotus is now relative to the importance of OS/2 to IBM, but I do not anticipate that we will do only OS/2 apps. That would be pressing the fool button."

Senior writer Suruchi Mohan and senior editor Jean S. Bozman contributed to this story.

Launch dates

Lotus expects to release a Windows 3.1 version of WordPro next month. The Windows 95 version of WordPro is due out before the end of the year. SmartSuite for Windows 95 is also expected by the end of the year, with the OS/2 version of SmartSuite slated to ship 180 days after its Windows 95 counterpart.

Workgroup wars

CONTINUED FROM COVER 1

of transaction processing systems and enterprise concerns. Lotus' control of that arena through Notes and enterprisewide electronic mail will be added to the IBM mix.

• Microsoft has a firm grip on desktop and end-user applications, with a view toward extending users' reach over the network via E-mail, particularly with its Exchange Server.

Key to IBM's success is how well it integrates Lotus. For example, IBM sits on a wealth of database expertise that could make Notes a more durable, enterprise-level product, analysts said. It appears IBM is wasting no time.

Prior to the merger, IBM had planned to link Notes with its DB2/6000 relational database for Unix servers, said Irving Wladawsky-Berger, IBM's RS/6000 general manager. Lotus and IBM's software lab in Toronto have been discussing the links for some time, he said.

To each his own

Microsoft claims an installed base of 85 million units of Windows 3.x, while IBM claims about 8 million for OS/2. Lotus says it has about 1.5 million Notes users.

Using DB2/6000 on a high-end IBM SP Unix server would provide data services over a large public network, including those from telephone companies, and even over the IBM Global Network, Wladawsky-Berger said.

DB2/6000 "can support the scalability of applications and collaborative computing, and Notes [is] a wonderful example of applications where [that] is so important," he said.

That is good news for Dennis Murray, a systems analyst who manages Notes for the regulatory affairs group at Sandoz Pharmaceuticals Corp. in East Hanover, N.J. He said he wants Notes to become the front end for back-end IBM databases such as DB2.

Executives could then distribute key business data, such as sales and inventory figures, and collaborate with others to determine what action to take and what assignments to make. "That's a powerful vision," Murray said.

Microsoft takes hits

Some analysts, meanwhile, are taking shots at Microsoft's desktop-centric approach to workgroup computing.

"Almost everything I see from Microsoft is a scaled up version of a single machine running fairly specific applications with packets of information going back and forth over E-mail," said Jeffrey Tarter, publisher of the "Soft Letter," an industry newsletter in Watertown, Mass. "But I don't see a great [understanding] of managing lots of transactions going on in lots of places."

Lotus' Notes strategy clearly indicates that Lotus understands enterprise and "inter"-enterprise computing, said David Marshak, an analyst at Patricia Seybold Group, Inc. in Boston.

Between its projected sales and IBM's services revenue for installing and supporting it, Notes could bring in more than $1 billion next year, said Scott McCready, director of workgroup computing at International Data Corp. in Framingham, Mass.

That could leave Microsoft with its still-unreleased Exchange Server — due out before year's end — in the position of being an also-ran.

Microsoft could come out a winner if it repositions Exchange as a communications infrastructure for Notes rather than a Notes competitor, according to McCready.

He said customers could choose the Exchange Server technology for messaging transport, security and ease of administration. But "Exchange can't out-Notes Notes, [so] I think Microsoft will have to provide many of the underpinnings for Notes" if it wants Exchange to be successful, he added.

CW staff Mitch Betts, Lisa Picarille, Kim S. Nash, Jean S. Bozman and Suruchi Mohan contributed to this report.

► **What's your view of IBM's buyout of Lotus? What questions would you like to ask IBM and Lotus executives about the merger? Sound off to us at talkback@cw.com. We'll publish a sampling of reader opinions in an upcoming issue.**

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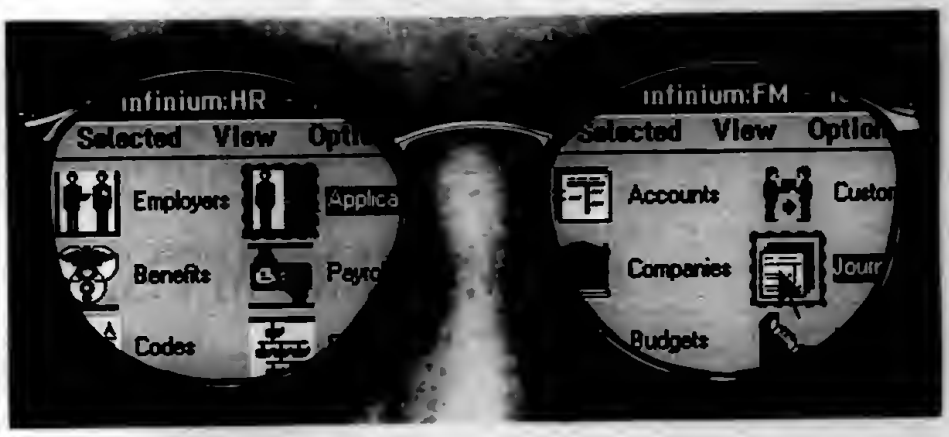

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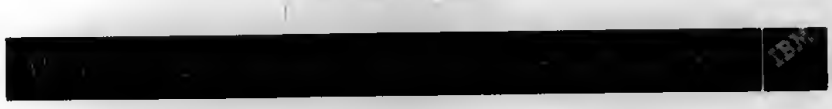


Going my way?

and SQLWindows development tools

JULY
- Ship SQLWindows Component Developer Kit

SEPTEMBER
- Integrate SQLWindows with Microsoft's SQL Server database

LATE 1995
- Ship Windows 95 version of SQLWindows
- Begin beta-testing a Macintosh version of SQLWindows

EARLY 1996
- Deliver upgrade of SQLBase with mobile features

Gupta in step with Microsoft

Tools have Win 95/NT bent

By Kim S. Nash

PALM DESERT, CALIF.

Attendees at Gupta Corp.'s annual developers conference here last week got an earful from company executives about Microsoft Corp. products.

That is, Gupta plans a string of upgrades to its development tools, database and related products that fall into lockstep with Microsoft's timetable and goals for Windows 95 and Windows NT (see chart).

Centura, a catchall term for Gupta's product strategy, "is closely aligned with Microsoft's direction," Gupta Chief Executive Officer Umang Gupta told a 1,000-member audience of users and developers last week.

"I like it that Gupta's taking a Microsoft direction. We are, too, in a lot of projects," said Marlow Hinton, manager of New Tools/Technology at AT&T's Human Resources Information Systems Organization in Greensboro, N.C.

"Microsoft is driving [client/server] technology, and I don't mind sitting in the front seat with them," added Earl Stahl, Gupta's chief technology officer.

The Menlo Park, Calif., company urged customers to plunge into developing applications compatible with Windows 95, rather than Windows 3.1, as soon as possible. In fact, the next major release of Gupta's SQLWindows development tool kit, due late this year, will sport the look and feel of Windows 95, Stahl said.

Buyout rumored

The extent of Gupta's making nice with Microsoft has led some observers to speculate that Microsoft may acquire Gupta, which has posted losses for six straight quarters.

That Computer Associates International, Inc. may buy Gupta is also a popular rumor. CA, in Islandia, N.Y., recently agreed to integrate Gupta's SQLBase database with the CA-OpenIngres products; CA also provided Gupta with a $7 million cash infusion and a $10 million loan [CW, April 10]. Officials from each company have denied the rumors, however.

"None of this was ever structured as a prelude to an acquisition," said Sam Inman, president and chief operating officer of Gupta. Yet the partnerships with CA and Microsoft have opened user doors once shut to Gupta, he said.

Safety first

IBM strives to improve on-line security

By Gary H. Anthes

Responding to increased corporate interest in the Internet and growing concerns about information security, IBM last week announced a number of products and services aimed at ensuring safe computing on the 'net.

These include plans to add support for Secure Hypertext Transfer Protocol (SHTTP) and Secure Sockets Layer (SSL) to its Internet servers and browsers for AIX and OS/2.

SHTTP and SSL are the leading encryption standards used to ensure secure commerce on the World-Wide Web.

The secured Web browsers and servers will soon enter beta testing and will be generally available by fall, IBM said.

IBM also launched a package of consulting services called I/T Security Consulting. It builds on the existing IBM consulting practice but adds tools and expertise for security, said Kathy Kincaid, director of information security programs.

In addition to management and technical consulting in security, the new practice offers the following services:

- A emergency response service, in which IBM will monitor customer networks and respond to intrusions.
- A Global Security Analysis Laboratory, by which IBM will conduct infiltration tests on customer networks and advise customers on how to fix security holes. "You might think of it as ethical hacking," said John Patrick, vice president for Internet applications.
- Antivirus software and services. Available by subscription, the service includes use of IBM's virus scanner — which IBM said can find and fix 6,000 viruses — and quarterly updates to the software. IBM said the software will soon be available as a shrink-wrapped commercial product and through IBM's antivirus Web home page.

Lloyd Boyd, supervisor of system services at Nissan North America, Inc. in Denver, said he hopes IBM can help him deal with security in an environment that is growing more distributed and complex and for which security tools are immature.

"We can't afford to have expertise in all these platforms and risks," he said. "It's more cost-effective to have someone like IBM help us."

Boyd said users — both internal and at Nissan dealerships — are clamoring for Internet access. "But right now, we are taking a very limited approach," he said. He added that IBM would offer Nissan a "test bed for security" through its Global Security Analysis Laboratory.

IBM's Internet security products

Clients	Server	Network services	Consulting and solutions
• Secure OS/2 Warp • Secure AIX • SHTTP and SSL	• Secure OS/2 Warp • Secure AIX • Secure AIX for Powerparallel • SHTTP and SSL	• Firewall service	• NetSP Firewall bundle • NetSP installation • Security service • Antivirus products and services

Scaling up

Duke Power Co. in Charlotte, N.C., uses IBM's antivirus product on 8,000 PCs and will soon buy licenses for all 14,000 of the company's machines, said Jim Appleyard, manager of information security and recovery services.

Appleyard said Duke Power is looking at IBM's Internet firewall product, among others. "The Internet is not a safe playground," he noted.

Separately, IBM's research laboratory in Zurich has developed tKP, a protocol for securing data communications among more than two parties. It is intended to secure electronic commerce involving, for example, a buyer, seller and financial institution, and it has been submitted to several standards bodies for consideration.

IBM hooks MVS, AS/400 to 'net

By Ellis Booker

IBM last week announced an extensive array of products and services for users seeking a home on the Internet.

They include World-Wide Web servers for OS/2, Unix and legacy systems; new capabilities for IBM's Web browser; authoring tools that promise faster and easier creation of Web applications; Internet access services; and a range of security products and services (see story above).

IBM also made good on a promise made earlier this year at Internet World to connect MVS mainframes and AS/400s to the Web. Users expressed a need for the legacy system ties.

"We're very keenly interested in the gateways to CICS and DB2," said Michael Czyz, an infrastructure engineer at CNA Insurance in Chicago. Czyz, a beta user of IBM's RS/6000 Web Server for the past month, said he could see using a direct connection to host databases to support internal Web-based applications.

"We have an in-house employee directory that, instead of having to drop into a [Microsoft Corp.] Access database, we would access directly from the [live] IBM host," Czyz said. "The ability to [do that] is very attractive."

The IBM Consulting Group will pull the plans together. Some analysts said the consulting and systems integration mix could produce a solid return for IBM. "They're packaging processes, not tools and technologies," said Christine Ferrusi Rose, an industry analyst at Dataquest, Inc. She said this would be a plus for information systems managers looking to justify involvement on the Internet to management.

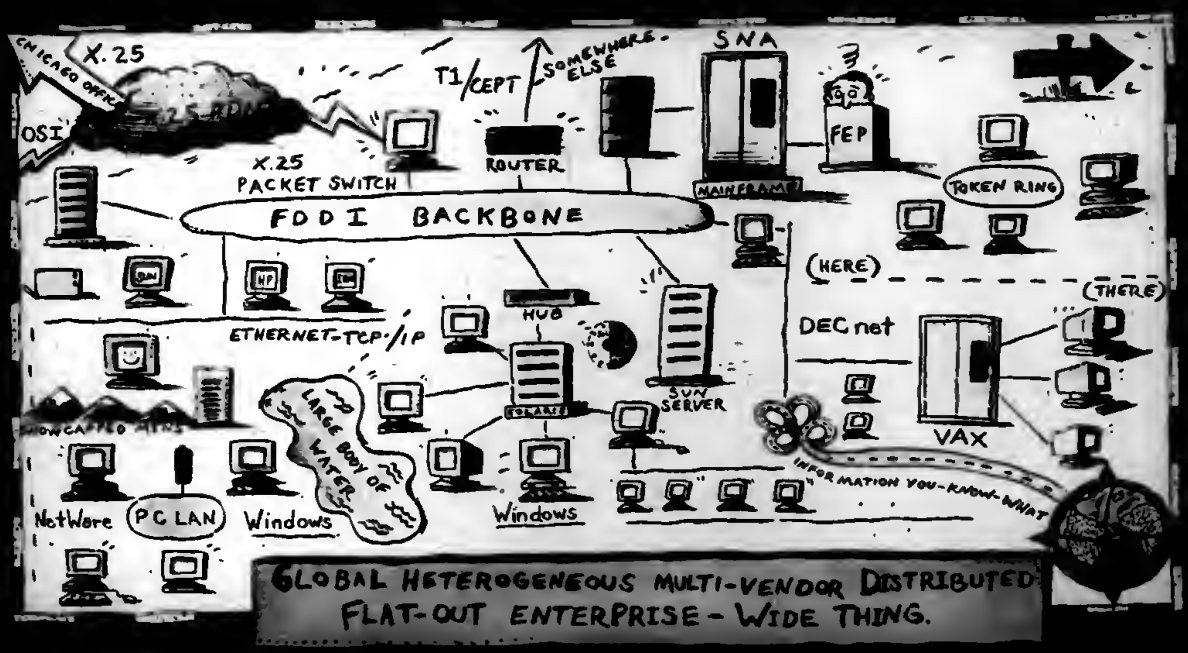
But not every observer agreed IBM would be a shoo-in for such contracts. Joel Maloff, president of The Maloff Co. in Dexter, Mich., said IBM and other top companies do not necessarily win bids for Web jobs. "The smaller, more entrepreneurial [providers] are often better positioned," he said.

IBM's Internet strategy

Clients	Server	Network services	Consulting services
OPERATING SYSTEMS • OS/2 Warp • OS/2 Warp enhancements • Windows • AIX	**OPERATING SYSTEMS** • OS/2 Warp • AIX • MVS • AS/400	**NETWORK ACCESS** • 28.8K bit/sec. ISDN • 450 locations • Network IP backbone	**SOLUTION/ SERVICES** • Internet implementation offering • AS/400 server installation
WEB EXPLORERS • OS/2 Warp • Windows	**INFORMATION GATEWAYS** • DB2/WWW • CICS/WWW • MQSeries/ WWW • VisualAge/ WWW	**CONTENT SERVICES** • Design • Creation • Hosting • InfoMarket Search (beta)	**CONSULTING** • Planning • Network design • Home-page design • Content design, creation and testing

• Available now • Preview • Generally available

Tax issues dog the Internet. See story on page 64.



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Low-end notebooks gain high-end features

By Jaikumar Vijayan

Tightfisted users who stood on the shore watching the recent flood of high-end notebook announcements should grab an oar.

A steady trickle of activity at the lower end of the pricing spectrum should ensure a supply of feature-rich, aggressively priced "value" notebooks in the third quarter.

For instance, introductions last week from Toshiba America Information Systems, Inc. in Irvine, Calif., and NEC Technologies, Inc. in Boxboro, Mass., are expected to set the tone for future low-end notebooks, which typically fall in the $2,000 to $4,000 price range.

The new products will shift several features recently found only in higher-end notebooks to lower, more accessible price points. These features include larger and better displays such as active-matrix color; longer-lasting lithium ion battery technology; expanded hard disk drive capacity and base memory — typically to a hard disk capacity of more than 500M bytes and at least 8M bytes of RAM; faster processors; and docking options that include full-featured multimedia.

One example is Toshiba's new Satellite T2130 series. Based on Intel Corp.'s 75-MHz DX4 processor, the notebooks feature base memory of 8M bytes of RAM and a hard disk drive capacity of 520M bytes.

Value notebooks: More bang for the buck

	NEC Versa 2000C	Toshiba Tan3oCT
Processor	75-MHz 486DX4	75-MHz 486DX4
Screen	Color, 9½-in. active-matrix thin film transistor (TFT)	Color, 10.4-in. active-matrix TFT
RAM	8M bytes	8M bytes
Hard drive	350M bytes	500M bytes
Price	$2,599	$3,299

The series offers either a 10.4-in. passive-matrix or active-matrix display. Other features include a fully built-in power supply requiring no external AC adapter and an optional port replicator.

A passive-matrix model with 8M bytes of RAM starts at $2,699.

"The value segment is undergoing a tremendous amount of change. There is a lot of focus in bringing bigger and better features," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

Plenty of choices

Like the Toshiba series, NEC's Versa 2000 line also is based on Intel's 75-MHz DX4 chip and comes with a variety of memory and hard disk options. The systems feature lithium ion battery technology and are available with 10.4-in. passive-matrix or 9½-in. active-matrix color displays.

An optional media dock with NEC's Versa 2000 turns the system into a full-fledged multimedia notebook. Features on the dock include an internal quad-speed CD-ROM, amplifier and speakers, business-quality audio, microphone, musical instrument digital interface, game port and a feature that allows the battery to be charged during system use.

The series also features an internal data/fax modem that comes standard on active-matrix models and as an option on other models.

Pricing on an entry-level, passive-matrix model with 4M bytes of RAM starts at $1,999, making it one of the most aggressively priced systems in its class, analysts said.

Both the NEC and Toshiba lines are expected to start shipping in July.

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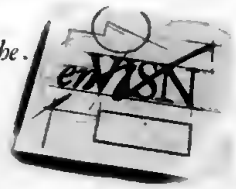

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'Tough love' tackles IS projects

CONTINUED FROM COVER 1

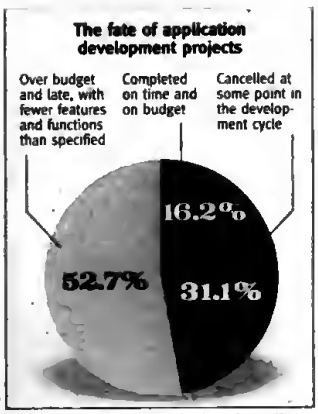
according to Warren G Herreid, a former lieutenant in the military and the office's senior director.

Most increases were due to changes in project requirements and/or development tools. Two years ago, for example, a midproject switch from Windows to OS/2 caused a 200% overrun and more than a one-year delay on a general ledger application.

Now, all project change requests with a price tag of more than $250,000 must be approved by a technology council and Herreid's office, which supports more than 70 active projects and a 750-person IS organization.

The office also maintains an on-line Notes-based database of all IS projects, their costs, deadlines, milestones and associated management issues. If a project begins to slip, the office dispatches a project management consultant whose time is paid for by the department sponsoring the project. Departments pay a monthly fee to finance the project office.

The fate of application development projects



Source: The Standish Group International, Inc., Dennis, Mass

Not surprisingly, this has caused some resentment.

"It's like the Internal Revenue Service coming in and then charging you to do an audit," Herreid said.

Look on the bright side

On the plus side, the database has worked to alert various project managers of potential problems before they flared up and eliminated the issue of multiple teams working on the same problems.

"In one case, we had a problem with the Smalltalk [programming language] in an OS/2 environment. We could either have put together a SWAT team on each project team or have one team solve the problem and put [the solution] in the database," Herreid explained.

In another case, a database entry from a project team experiencing a shortage of Smalltalk programmers triggered the project office to immediately hire contractors and initiate Smalltalk training sessions.

Productivity has increased 40% since United Air Lines created its four-person, San Francisco-based IS project office, according to Richard L. Gleason, project office manager. Currently, the office supports 17 major development projects. It also maintains an on-line electronic library containing all project deliverables, schedules and documentation.

"Before the project office, the planning that got done had the depth of a back-lot facade you see at Universal Studios," Gleason said. "Now we have a very standardized way of planning projects with a financial aspect tied in to track how we are doing against those plans."

At Nynex, tracking a project's progress against its initial goals not only helps keep a development project on track, but also helps IS measure and document productivity, said Richard V. Mulcahy, staff director of IS at the company.

"When processes were manual, it was easy to measure IS productivity. If you automated payroll, you'd lose 30 clerks. So it was easy to prove IS's worth," Mulcahy said. "Now that we've squeezed out most of the fat from the organization, we need to move to improved project management efficiency."

Little user involvement and scant attention to up-front planning are two reasons why software projects fail. See page 81.

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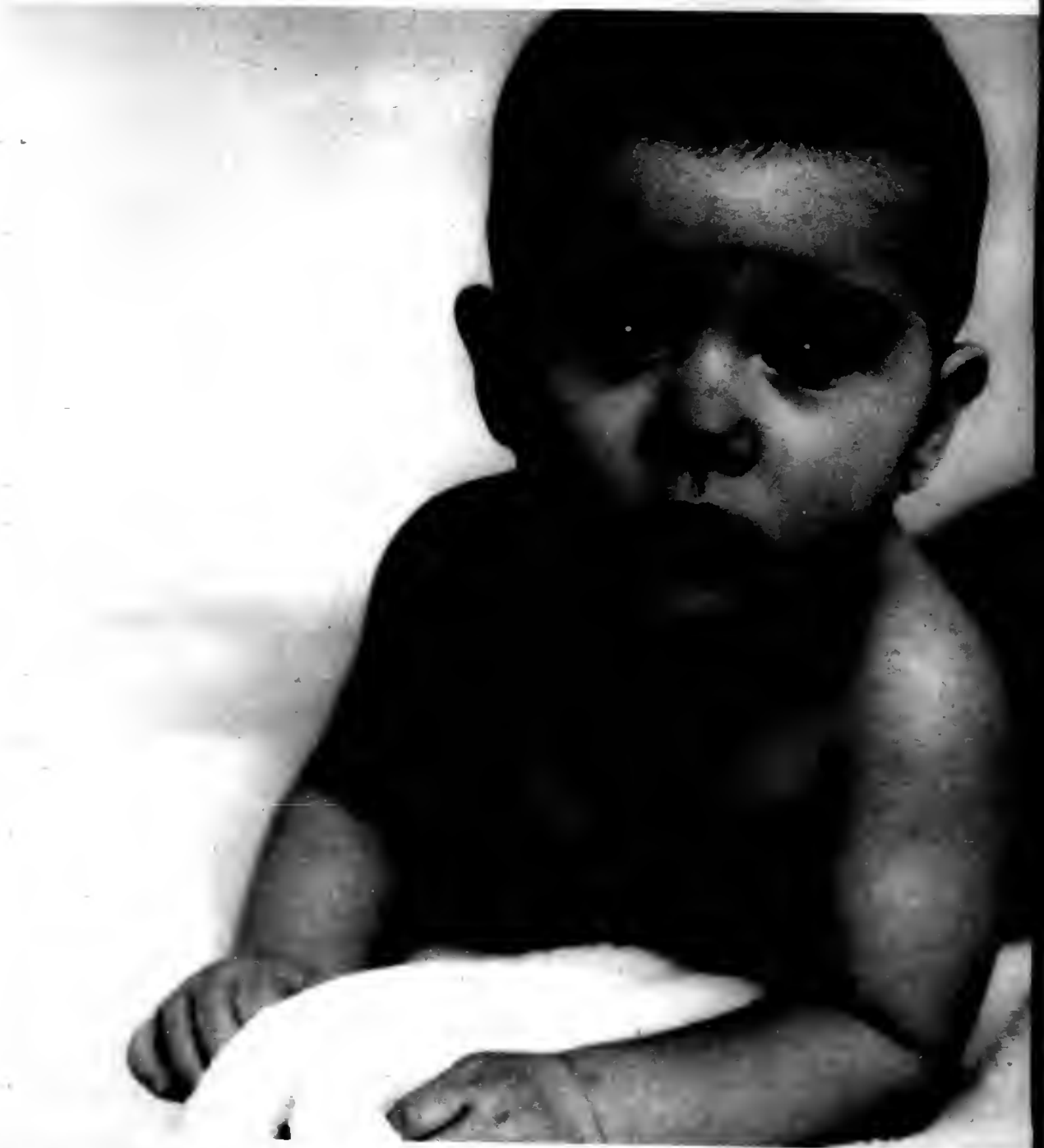

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Thanks to a new Health Data Network, doctors in seven Dayton area hospitals are now spending more time with patients, and almost no time looking for records.

The network, spearheaded by IBM, lets authorized doctors look up medical histories within seconds – no matter where their patients were treated. Test results are also included, so repetitive testing has dropped.

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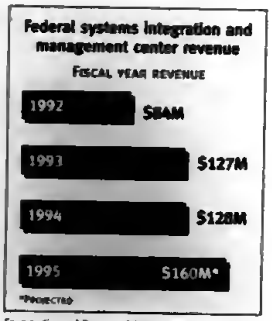
Government awards go paperless

Contracting overhaul promises big savings, faster technology awards

By Gary H. Anthes
WASHINGTON

■ The federal government has embarked on a bold experiment in the way it buys complex computer systems, and early evidence suggests it may dramatically reduce the time and cost of awarding contracts.

Under new procurement rules and procedures, bids will be evaluated and awards will be made to preapproved vendors in a fast-track process that all but eliminates paper. The government recently conducted three pilot procurements testing the new rules and found that the faster and simpler procedures allowed vendors and buyers to cut contracting costs by two-thirds.



Source: General Services Administration, Washington

The government has issued a request for proposals (RFP) for a five-year, $840 million contract to be awarded to two to seven systems integrators. The winners, which will be announced by the end of the summer, will supply a broad range of systems development services throughout the federal government. They will, in essence, be given an $840 million purchase order from Uncle Sam.

The RFP was issued by the Federal Systems Integration and Management Center (Fedsim), a unit administered by the U.S. General Services Administration (GSA) that procures systems on behalf of client agencies on a voluntary, cost-reimbursable basis. Fedsim acts on behalf of agencies without the technical expertise to manage complex information technology procurements. It will receive some $160 million this year.

Preferred vendors

Under the new guidelines, vendors are selected to a preferred list, and Fedsim issues work orders to them after an accelerated bidding process that greatly reduces contracting red tape. Lawrence S. Cohan, deputy commissioner for information technology integration at GSA, said he hopes to cut the time it takes to issue an award from six months to four weeks.

Once this umbrella contract has been awarded to the stable of vendors, requests for bids on specific work will be sent out as the need arises. These "statements of work" will include bid evaluation criteria and the weight that the government has assigned to each criterion. Previously, the weights have been kept secret, prompting vendors to complain that they are working in the dark as they prepare proposals.

"There will be totally open communications in procurement," said Joe M. Thompson, the GSA's commissioner for information technology service. "That's never been done before."

The new rules will also allow for consideration of bidders' past performances, something not taken into account in most government purchases. "This is a common-sense commercial model that we have never used in government," Thompson said.

Vendors bidding on a statement of work will submit price proposals on a spreadsheet disk supplied by Fedsim and give Fedsim and the client agency a two-hour oral proposal. Nothing will be submitted in writing, although the briefing will be videotaped.

GSA Commissioner Joe M. Thompson: *"There will be totally open communications in procurement. That's never been done before. This is a common-sense commercial model that we have never used in government."*

Timetables

Under normal procedures, it might take four weeks of back and forth mailings to accomplish what will now be done in four hours, said Charles Self, deputy assistant commissioner for information technology integration.

"This promises time and cost savings, but I'm most excited about the time savings because the biggest concern of our clients is just getting the job done," Self said.

Perhaps most remarkable is the fact that bid evaluations will be performed immediately. A panel of evaluators will vote by assigning a numeric score to a vendor's performance on each criterion. A composite score will then be developed similar to the way Olympic diving scores are compiled.

As a final bonus, the delivery orders awarded to winning bidders may not be protested by the losers, according to the Federal Acquisition Streamlining Act of 1994.

A Pentagon agency reconfigures its stovepipes. See page 82.

Radius signs up IBM to make Mac clones

Systems due in August

By Lisa Picarille

In a roundabout way, IBM is getting into the Macintosh clone market.

IBM's Microelectronics Division is about to strike a deal to manufacture PowerPC-based Power Macintosh systems for Radius, Inc., one of the first licensees of Apple Computer, Inc.'s Mac OS, according to officials at the Sunnyvale, Calif., company.

Radius and IBM declined to provide any further details because the contract is still under negotiation.

However, sources close to Radius said, IBM will use its Charlotte, N.C., manufacturing plant to make Radius-labeled PowerPC 601-based Power Macintoshes, due in August. IBM also will manufacture Radius' forthcoming 604-based Power Macintoshes, which have yet to be announced. Radius is expected to use IBM as its 604 chip source, the sources said.

Jeff Tarter, editor of "Soft Letter," an industry newsletter in Watertown, Mass., noted IBM often attempts to take advantage of idle manufacturing facilities by contracting with other vendors.

Although IBM has no previous experience building Macintoshes, many observers say it will not be a difficult task because the machines are PowerPC systems that run the Macintosh operating system. "It's on par with assembling a radio," Tarter said.

"It would be a smart move for IBM to license the Mac OS. But right now IBM doesn't want to be linked that closely to Apple."
— Joe Feriazzo, WorkGroup Technologies

The upside

Analysts say the benefits for Radius are obvious.

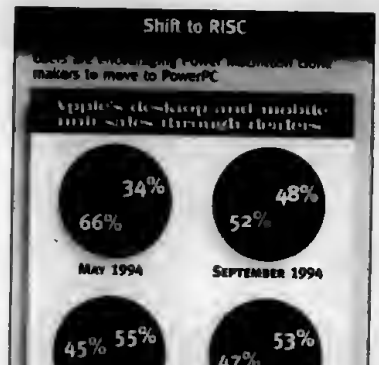
"Radius gets a very credible manufacturing partner while decreasing their own costs by not having to lay out the cash to manufacture products in the untested Mac clone waters," said Amy Wohl, president of Wohl Associates, a research firm in Narbarth, Penn.

"It's a step toward validation of the Mac clone market," said Joe Feriazzo, a senior analyst at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H. The deal also helps bolster the IBM/Apple/Motorola, Inc. PowerPC platform initiative and gives IBM another customer for its PowerPC 604 chips, he said.

Industry watchers speculated that IBM may be looking for a backdoor entry into the Power Macintosh clone market, which in addition to strengthening the PowerPC movement would give IBM another source of revenue and give IBM customers a broader choice of machines from a single supplier. However, IBM to date has resisted a direct move toward licensing the Mac OS, and that resistance might be viewed as backing off OS/2.

"It would be a smart move for IBM to license the Mac OS. But right now IBM doesn't want to be that closely linked to Apple, especially in light of [Chairman Louis] Gerstner's saying how committed IBM is to OS/2," Feriazzo said.

"IBM is interested in being cautious. They are not saying anything about dealing with other operating systems. They don't want to disturb any OS/2 momentum that may be building, especially since they still have time before Windows 95 comes out," Wohl said.



Source: Computer Intelligence InfoCorp, La Jolla, Calif.

Apple rolls out Macintoshes based on the PCI bus. See page 48.

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Servers

CONTINUED FROM COVER 1

in San Jose, Calif.

The one-two punch of Microsoft Corp.'s Windows NT operating system and Intel's upcoming P6 chip should make PC servers even more capable of going on the offensive, observers said.

But skepticism remains the order of the day when it comes to PC servers' taking over big chunks of mission-critical application workloads. For now, the vast majority are still used for file and print sharing on LANs, analysts said. And it is software, not hardware, that holds the key to their upward march.

The raw processing power and speed of today's PC servers "could easily lend themselves to running mission-critical applications," said Fred Deboer, director of network services at Advanced Technologies Laboratories in Bothell, Wash. "But the biggest problem is that, in general, they don't scale well."

"You can put PC servers into a full-time production environment, but you can't just run them and forget about them," said Ken Smith, manager of system software at Canada Housing and Mortgage Corp. in Ottawa. "Unfortunately, you take a gigantic drop in reliability."

By contrast, Unix servers provide more horsepower and have the flexibility and database support to scale up to mainframe-like levels as applications grow. Meanwhile, IBM's AS/400 and its integrated database offer unmatched product breadth and chug along placidly in the corner of large and small offices alike. It rarely breaks down or requires much hands-on attention, analysts and users agreed.

Server speak

How we defined the different classes of servers for this story:

PC SERVERS: Intel microprocessor-based servers typically used to run core network operating systems, file and print sharing and sometimes for distributed access to databases and E-mail systems. An example is Compaq's ProLiant 4500.

UNIX SERVERS: Dedicated midrange-class systems based on RISC microprocessors and Unix operating system. Examples include Hewlett-Packard's HP 9000 series or Sun's SPARCcenter 2000. Used mainly as robust application and database servers.

AS/400: Traditional minicomputers from IBM, now being converted from a proprietary chip set to a more open client/server system based on RISC processors. Mainly used for on-line transaction processing and general business applications.

No match

Not even Compaq claims PC servers can meet all the key requirements for enterprise-level computing. The biggest shortcomings cited by users and analysts include the following:

- Supporting PC servers is a manual task, and remote support tools are especially absent.
- Most servers are not trusted to handle more than 100 or so users due to I/O limits and operating system foibles.
- System services such as data recovery, application tuning, backup and security are not as robust as on midrange systems.
- For all its power, PC hardware remains PC hardware, and downtime is a fact of life.

PC servers are still considered too unreliable to run mission-critical applications at Hyatt Hotels and Resorts, which needs the higher data availability provided by Unix servers, said Scott Andersen, director of technology at the IS unit of the Chicago-based hotel chain. "A hotel never closes," he said.

Methods of bringing PC servers back to life also remain primitive. "It's not unusual for a PC to burp, and what do you do? You reboot it," said Merril Dempsey, information services director at The Morningstar Group, Inc. in Dallas. "But it's hard to reboot a business application in the middle of [a job]."

Nonetheless, some bleeding-edge organizations are proving it possible to run their operations entirely on PC servers. For example, Brigham and Women's Hospital in Boston runs all of its applications on 162 PC servers. With a little system and network tweaking, the servers handle everything the hospital throws at them, said John Glaser, vice president of IS (see story, page 33).

Different strokes

Users and analysts cited the following strengths and weaknesses for the various platforms:

	Strengths	Weaknesses
PC servers	• Hardware is cheap and offers the best price/performance • Operating environment is familiar to PC-oriented end users • PC platforms are open and standards-based • Tools for rapid application development are plentiful	• Hardware is less reliable and fault tolerant than larger systems • Lack of tools makes systems management labor-intensive • Operating systems capable of symmetrical multiprocessing do not scale well • I/O bottlenecks hamper performance
Unix systems	• RISC microprocessors provide best raw performance • Operating system is mature and scalable to mainframe levels • Systems and network management tools are becoming more robust • Databases and packaged applications with graphical user interfaces are widely available	• Management tools are not as strong as on the AS/400 • Arcane system commands make Unix difficult to use • Large amounts of integration and customization are necessary • Support is limited for Windows applications, though translation packages are available
AS/400 servers	• Cost of ownership is often lower than on other platforms • Database and management tools are integrated into the system • Hardware is highly reliable and secure • Application portfolio is the largest in the industry	• Few packaged applications have graphical user interfaces • Purchase price can be more expensive than competing systems • System is still struggling to shake proprietary minicomputer image • Hardware and operating system only available from IBM

Putting it all together

In a confusing world of Unix servers, PC servers and traditional midrange machines, users can indeed have it all — as long as they have a client/server architecture to hold everything together.

That is the word from some of the nation's largest corporations, which mix and match Unix and PC servers on the enterprise network. In such a world, the critical factor is the ability to administer a variety of servers — often with one type of relational database or networking software as the common element — on a single corporate network.

Essential link

At GTE Telephone Operations in Tampa, Fla., for example, an open systems network is the common link for a variety of servers, including the company's IBM-compatible mainframes and hundreds of HP Unix servers running customer service software.

GTE Telephone's original IBM SNA network slowly evolved into a TCP/IP network that could connect to all servers. "We've had the opportunity to wrest away applications from the mainframe or replace them," said Ed Riedy, a senior technology consultant.

At Dunkin' Donuts, Inc. in Randolph, Mass., 250 users access a large Sun Microsystems, Inc. Unix server as the site's host computer. But there are also 500 Windows PCs, including five PC LAN servers running Banyan Systems, Inc.'s Vines software, PC applications and electronic mail.

"Everything is connected through the Banyan network," explained Dan Inglis, director of systems development. Administration is centralized through Banyan consoles. "You can create a user log-in once, and you don't have to do that on each and every server."

For BP Exploration Alaska in Anchorage, the common thread in the corporate IS architecture is the Sybase, Inc. relational database. The site has 100 Unix workstations, 30 Unix servers and 10 PC servers, said David Truch, partner relations manager at the company's Information and Data Management group.

Flexibility is the chief benefit of client/server architectures and enterprise networks, users at these mixed sites said. Servers can be added at will in a plug-and-play fashion.

"I have greater flexibility in a client/server world than I've ever had before. I can change the machine and still have everything look fine," Truch said. "Before, it took a tremendous effort to move software from one platform to another."

— Jean S. Bozman

Making it happen

Dominion Textile, Inc., a $1 billion textile manufacturer in Montreal that runs most of its business on the AS/400, is debating whether it should move some processing to servers. The LAN "is becoming a viable place to run some applications," said Gilles-Andre Morin, Dominion's director of planning and technology. "It brings an interesting cost/performance ratio compared to larger systems."

Intel's P6, which was designed from the ground up for the server market, should provide three to four times better price/performance than existing RISC chips when it ships to vendors later this year, said Rob Thotemeier, an analyst at Meta Group, Inc.'s Burlingame, Calif., office. That kind of gap "causes everybody to rethink what they're doing," he added.

High-end PC servers from vendors such as Compaq, IBM and Hewlett-Packard Co. were designed to be application and database servers. All of them support symmetrical multiprocessing plus features such as RAID storage, error checking and correcting memory, parity memory and limited

Anchors aweigh with AS/400s

In 1991, The Morningstar Group, Inc. started replacing a hodgepodge of minicomputers and mainframes with a central Unix system and PC servers at its six plants. More than two years later, the Dallas food products company had nothing to show for it but a bill that was $3.5 million and rising.

The Hewlett-Packard Co. HP 9000 Unix machine was supposed to run financials, production and distribution companywide, while Dell Computer Corp. PC servers would do the same at each plant. But Morningstar ran into software integration problems.

By early 1994, dismayed company executives estimated they needed another $1.5 million to get the distributed system up and running, said Merril Dempsey, information services director at the company's data center in Madison, Wis.

"They really got nothing accomplished other than spending big bucks on software and networks," said Dempsey, who was brought in last year by a new management team to fix the situation. He switched horses in midstream, opting for an IBM AS/400 that cost about $1 million and was fully operational by the end of 1994 — six months after Morningstar bought the machine.

The company was drawn by the AS/400's huge application portfolio and its high level of integration, which combine to make development relatively simple, Dempsey said. "It costs a lot less to get a working system up on the AS/400 compared to other environments where you're reinventing the wheel," he said.

Ongoing management and support is also expected to be easier and less expensive on the AS/400, Dempsey added. Morningstar is getting by with three employees supporting the AS/400 — less than half the staffers involved with the HP 9000, he said.

The company's AS/400 Advanced System Model 310 is being used in terminal mode to run its operations, while the Dell boxes are being recast purely as local print servers, Dempsey said. Meanwhile, the HP machine is sitting idle in the Dallas headquarters and "may end up to be a boat anchor." — *Craig Stedman*

Morningstar information services director Merril Dempsey *came aboard to help pull the company out of an integration gone wrong and turned to AS/400s to ease management and save money*

fault tolerance, analysts said.

Next year, Compaq plans to add server clusters that will scale up to an estimated 3,500 transactions per second — more than five times its peak now. In addition, Intel is scheduled by year's end to release a 32-bit I/O chip that should help ease disk and network I/O bottlenecks that have long been the bane of general-purpose PC servers.

But hardware is not what really matters. The great divide separating PC servers from midrange systems comes down to software. PC server penetration into the enterprise "depends only on how far [Windows] NT can take it," said James Greene, an analyst at Summit Strategies, Inc. in Boston.

Windows NT should pose a threat to Unix systems in particular once it rises to a higher level of scalability and connectivity, said Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Newton, Mass. "The Unix servers came into the enterprise and surrounded the mainframe, and now Microsoft would like to come in and surround the Unix servers," she said.

Not so fast

But a recent report by Gartner Group, Inc. in Stamford, Conn., predicted it will be late next year before Windows NT-based systems can scale beyond two or four processors and tackle big applications. The server version of IBM's OS/2 is little more than desktop software "hacked to perform server functions," the report concluded.

Neither are midrange systems standing still while the PC server wave crashes over their heads.

Intel's P6 chip notwithstanding, Unix/RISC systems are expected to retain their raw performance lead. And IBM has spent more than $1 billion transforming the AS/400 from a workhorse into a sleek trotter. Database and TCP/IP performance have already been improved, and the transformation will culminate this week with the introduction of 64-bit RISC models.

Furthermore, the price advantages of PC servers can melt away under the glare of operating costs. Recent cost of ownership surveys by International Data Corp. (IDC) in Framingham, Mass., showed the AS/400 was less expensive to use over five years at both large and small companies due to lower software and operations costs.

Compared with a Novell, Inc. NetWare LAN, total monthly costs for the AS/400 were 5% less in decentralized shops with about 1,800 users and 9% less in companies with up to 100 users, IDC said. In distributed environments such as retail stores, the AS/400 was 54% cheaper. An HP 9000 Unix server and Digital Equipment Corp.'s Alpha and VAX hardware also were more expensive than the AS/400.

At Canada Housing and Mortgage, just one person supports more than 40 AS/400s at headquarters and in branch offices, while a dozen people are needed for 100 or so PC servers, Smith said. "Remote management tools [for the servers] are awkward as hell. And if something goes wrong in the field, we have to fly somebody out to fix it. We almost never send anybody out for an AS/400 problem," he said.

"As you put servers all around the world, you can't put people all around the world to manage them," said Robert B. Carter, vice president of corporate systems development at Fedex Corp. in Memphis, Tenn., which favors Unix servers over PCs.

Union Bank in Monterey Park, Calif., plans this year to start installing OS/2 servers in its 230 offices to run branch sales. But its ability to support the machines with a group of 15 roving technicians "is the million-dollar question," said Joe Waynick, assistant vice president of technical support. "We'll know in a couple years whether or not this is going to pay off," he said.

PCs: Just what the doctor ordered

At Brigham and Women's Hospital in Boston, PCs rule the enterprise.

The hospital, a 713-bed nonprofit teaching affiliate of Harvard Medical School, has relied exclusively on PC-based architectures to run all of its applications ever since it moved off its old minicomputer platforms in 1989.

Brigham and Women's has an estimated 4,300 clients tied into 162 PC servers that support 80 applications, including all transaction-intensive, enterprisewide, mission-critical applications.

The decision to go to a totally PC-based architecture was made when hospital administrators decided to move their 60-odd applications out of a dialect of MUMPS — a special programming language designed for health care use — to standard MUMPS, said John Glaser, vice president of IS.

"We were looking for some very specific requirements," Glaser said, ticking off a list that included significant price/performance ratios, a high degree of low-cost scalability, standard off-the-shelf commodity technology and robust third-party software development activity.

Brigham and Women's V.P. of IS John Glaser: *'We are getting the performance and scalability we were looking for'*

"We had a list of about 14 major concerns we had with the [PC-based] technology," which the IS department had to first address, Glaser recalled. Those included issues such as scalability, network and system saturation and disk and network I/O bottlenecks.

Concerns that some of the larger, critical applications would saturate the capabilities of PC servers were handled by splitting up the applications into smaller parts and running them on more than one server. Fears that the backbone network would become congested were handled by splitting the traffic over two networks.

Similarly, network and disk I/O bottlenecks have been eased through extensive memory caching techniques, which basically put the most read data in easily accessed caches on the network.

"It's worked out very well for us. So far I haven't seen anything that we did wrong," Glaser said. "We are getting the performance and the scalability we were looking for."

— *Jaikumar Vijayan*

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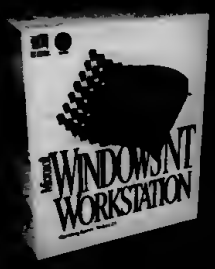

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Briefs

Shiva makes deal

Remote access vendor Shiva Corp. last week announced the acquisition of Spider Systems Ltd., an Integrated Services Digital Network access company in Edinburgh, Scotland. Burlington, Mass.-based Shiva will acquire Spider Systems for approximately 2 million shares of Shiva common stock, currently valued at roughly $80 million. The combined companies will provide remote access products to public and private networks worldwide.

Adaptec buys firm

Adaptec, Inc. in Milpitas, Calif., has agreed to buy Trillium Research, Inc. in Hudson, Wis., in a $3 million cash transaction. Privately held Trillium develops and manufactures RAID software for the Apple Computer, Inc. market.

Outsourcers merge

Computer Outsourcing Services, Inc., a national provider of payroll and data processing services, has completed its acquisition of Murray Hill, N.J.-based outsourcing company MCC Corp. for an undisclosed amount of cash and notes.

SHORT TAKES Platinum Software Corp. has received an $18.2 million investment from a group of investors led by Sprout Group. . . . Stephen Wright has been named president and chief executive officer of CODA, Inc., a provider of financial software and services. . . . Datalogix International, Inc. issued an initial public offering last week of 3.3 million shares for $17 each. Shares in the partly Oracle Corp.-owned company traded at $23 each late last week. . . . U.S. District Court Judge Robert P. Aguilar has dismissed by summary judgment a 3½-year-old, $120 million class-action shareholder's lawsuit against Cypress Semiconductor Corp.

IBM, Lotus iron out agreement

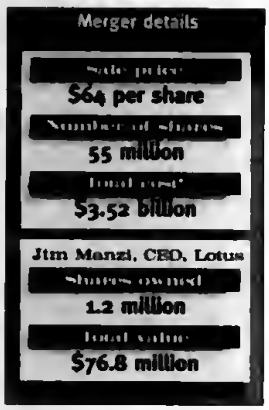
Twin sights set on control of desktop

By Neal Weinberg

Now that Lotus Development Corp. has agreed to a $3.52 billion buyout by IBM, the companies are hammering out a governance agreement before they turn their attention to the larger battle against Microsoft Corp. and Intel Corp., industry analysts said last week.

In one frenzied week, IBM managed to turn a hostile $60-per-share bid into a friendly $64-per-share takeover, under which Lotus becomes an IBM subsidiary.

Lotus Chief Executive Officer Jim Manzi, 43, will keep his job and gain the title of senior vice president at IBM. Notes developer Ray Ozzie, who emerged as a strong Manzi supporter, has agreed to remain on board.



In control

The agreement is expected to provide Lotus with a great deal of autonomy. For example, Manzi is expected to control hiring at Lotus.

While IBM is saying it will not precipitate additional layoffs at Lotus, the already-announced cost cutting will proceed as planned. Lotus needs to slash $50 million in operating expenses this year.

For the deal to be successful, IBM "must make love to the Lotus developers" as well as promote Notes as an open systems solution, said Charles Federman, managing partner at Broadview Associates, Inc., a merger and acquisition adviser in Fort Lee, N.J.

Whether Manzi, Ozzie and the rest of the Lotus talent stay on for any length of time depends on how the two corporate cultures mesh, analysts said.

Even if IBM manages to make the deal work, it still faces an uphill climb in its battle for control of the desktop, industry observers noted.

IBM's Louis Gerstner *(left) and Lotus' Jim Manzi plan to go up against Microsoft and Intel*

But Peter Kastner, an analyst at Aberdeen Group, Inc. in Boston, said Lotus is a key piece of IBM's overall plan. "Lotus is not a pawn, but a bishop in a complicated chessboard strategy by IBM to wrest control of the desktop away from Intel and Microsoft," he said.

Execution is key

Kastner said IBM has a strategy that includes PowerPC-based hardware, desktop and groupware applications from Lotus and future applications under development.

IBM has to "execute nearly perfectly because they are so far behind," Kastner added.

Roxanne Googin, an analyst at Gruntal & Co. in Los Angeles, said IBM and Microsoft are fighting for supremacy in the world of 32-bit, enterprisewide network solutions. While Microsoft controls market share for desktop operating systems, Googin said the company has not proved that it can solve systemwide problems.

On the other hand, IBM, with all its flaws, does have a hardware-based reputation for reliability, and that is what companies want as they move to multitasking, enterprisewide workgroups, she said.

In the meantime, Intel CEO Andy Grove and Microsoft CEO Bill Gates are hardly sitting still. "They will continue to whip their companies [and] continue to innovate so that IBM or anybody else can never catch up," Kastner said.

Oracle alters plan, buys OLAP products

By Kim S. Nash

Oracle Corp. ate $100 million worth of crow last week.

The Redwood Shores, Calif., database giant has maintained that its Oracle7 relational database is just fine for huge, and massively complex, data warehouse applications. But Oracle backpedaled on that contention last week by announcing that it paid $100 million for on-line analytical processing (OLAP) products from Information Resources, Inc. in Chicago.

Proponents of OLAP technology say it is better suited than relational products — with their rigid rows and columns — to handle data warehousing tasks, such as indexing, querying and massaging hundreds of gigabytes of information.

"Oracle is acknowledging that relational databases are insufficient for this kind of work [and] that they need help," said Richard Creeth, president of Creeth, Richman and Associates, Inc., a consulting firm in Norwalk, Conn.

Specifically, Oracle bought the Express line, which was sold by Information Resources' IRI Software division in Waltham, Mass. Information Resources sold IRI because the unit is tangential to the firm's core business of selling data on consumer buying habits, a spokesman said.

Oracle also offered jobs to 600 IRI employees, including developers, consultants and technical support staff.

Packaged together

The Express line includes a multidimensional database and several analysis and reporting packages.

Comshare, Inc., a key IRI rival, said it views the deal positively. "This validates the need for OLAP. The whole market will grow, and we'll share in that," said Wally Wrathall, chief executive officer at Comshare in Ann Arbor, Mich.

This validation will come at a price, since Oracle will also compete in that market. That means Comshare and other companies, which pale in size next to $3 billion Oracle, will have to step lively, Creeth said.

OLAP vendors "have got to be concerned about suddenly having such a powerful competitor," he noted.

Currently, Express and Oracle products communicate via application programming interfaces. Ultimately, Oracle plans to integrate Express into the Oracle7 database, but officials declined to specify when that would happen.

Users will be able to get Express products from Oracle or IRI, which plans to license them back from Oracle and resell them. IRI will also resell the Oracle7 database, the companies said.

Pumping up

Another reporting and analysis tool maker, Business Objects, Inc., plans this week to announce deals with four large consulting firms to push its PC-based query products to customers building large data warehousing systems. Price Waterhouse, Sequent Computer Systems, Inc. and Unisys Corp. all plan to resell Business Objects' namesake end-user tools. SHL Systemhouse, Inc., meanwhile, plans to use the products in its warehousing laboratory, said spokesman Jeff Coombs.

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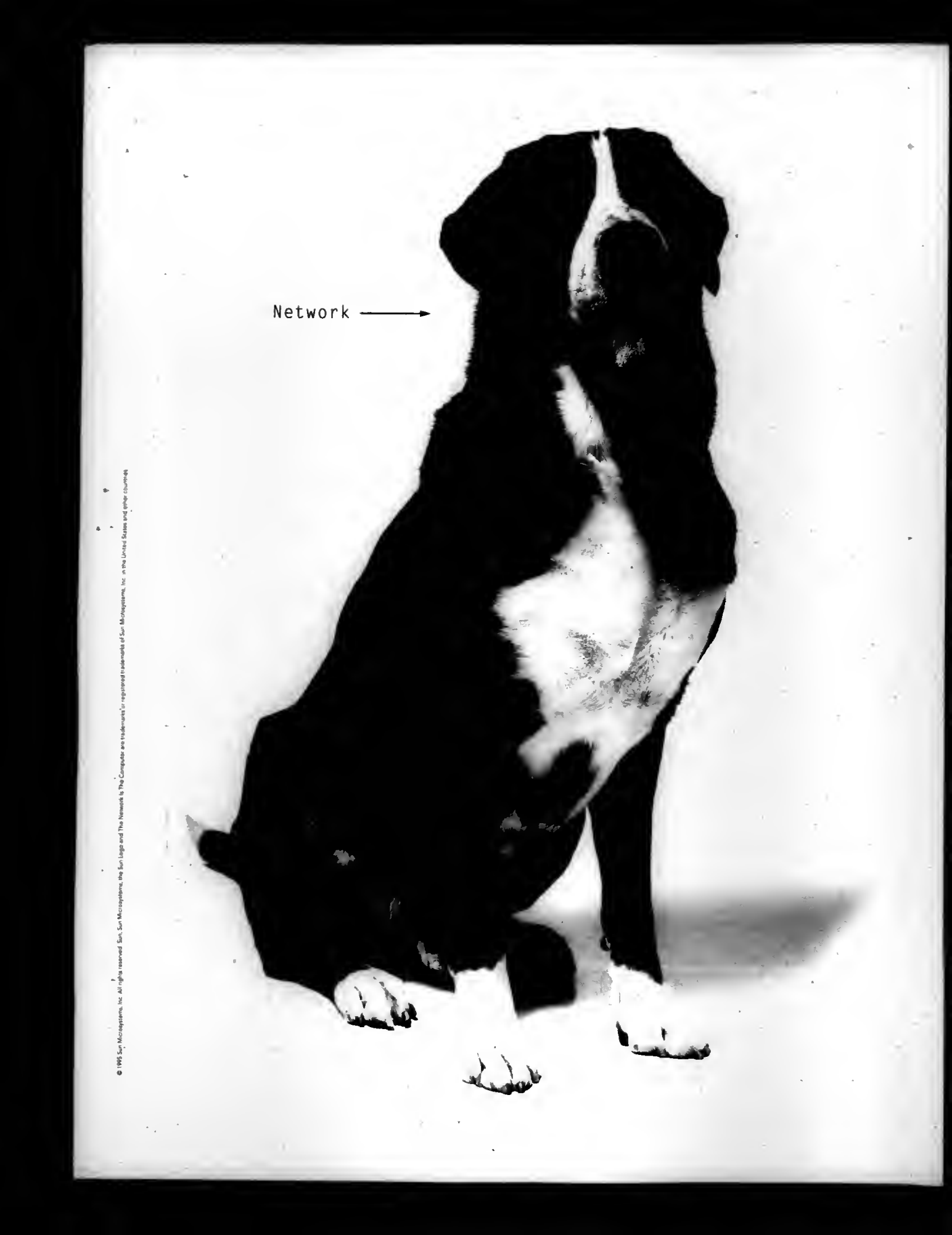

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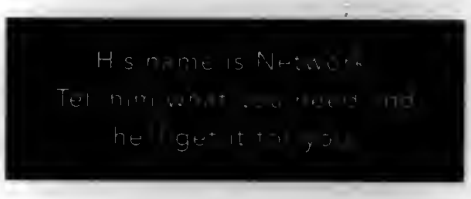

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Video nondemand

With a cloud of wasted electrons and a thud of consumer disinterest, one of the silliest technology fads of the past five years has come crashing to earth. Video-on-demand is packing its bags and heading home for a few years. Good riddance.

Earlier this month, US West, Bell Atlantic and Interactive Network pulled the plug on either applications for or trials of several video-on-demand services. The experts now say widespread consumer availability is about five years away (but don't hold your breath on that one).

Most *Computerworld* readers have better things to do than worry about having *Beavis and Butthead* at their fingertips. But the lessons of this white elephant are useful to consider for technology applications in general. If you want to fail in a large project, do what the interactive video pioneers did:

- **Ignore the infrastructure.** From the beginning, video enthusiasts and salivating news media acted like the lack of cabling, software and compression standards for digital media was no big deal. It was the killer. Never, never underestimate the difficulty of changing the communications infrastructure. It will take a very long time to upgrade it to the point that high-speed data services become cost-effective in the mass market. Heck, Integrated Services Digital Network (ISDN) has flopped, and that doesn't even require new phone lines.
- **Overestimate demand.** Some people are already beginning to tune out the Internet because of the volume of useless information it contains. Did people really want to comb through 500 more channels of noise? The average knowledge worker today is deluged with publications, electronic services, advertising, E-mail and other interruptions. The technologies that will do best will be those that screen and simplify things, not make them more complex. Invest in navigators and agents. Don't look for ways to shove more bits down a line.
- **Find complex solutions to simple problems.** The video-on-demand people found to their surprise that a $1,000 set-top box and $50-per-month service fees couldn't compete with a $1.50 video rental. They were so taken with their own technology that they ignored the fact that a simple, low-tech alternative was more attractive. Lesson: Look for the simple solution first.
- **Drink your own Kool-Aid.** You'd think we'd have learned our lesson from fusion in a bottle. The media jumped on digital video because it was just so sexy. Industry executives read the stories and figured they had to have a video story, too. Everyone was so busy talking to one another that no one bothered to ask potential customers what they thought. And they were watching *Seinfeld*.

Paul Gillin, *Editor*
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No lack of native Power Mac apps

In "PowerPC players set to make big product splash" [CW, June 5], you write, "While [Apple and IBM] plan to introduce new PowerPC products on June 19, users will likely find the offerings disappointing, given the lack of native application software for the platforms."

Did you copy this off an Intel brochure? Users are salivating for the new PCI Power Macintoshes, especially the targeted users — digital video and prepress users. And while the number of native applications is not overwhelming, there is certainly not a lack of them. I would be interested in hearing what application software you want to use that doesn't have a native counterpart on the Power Macintosh.

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Merely a buzzword

"Smarten up!" [CW, June 5] portrays knowledge management as the cornerstone of a knowledge organization. I agree that leveraging knowledge capital is crucial, but "knowledge management" is merely a buzzword.

Not long ago, companies rallied around total quality management (TQM) as a pathway to profitability. It became a buzzword because businesses realized that building quality comes from new attitudes, not 10-step processes. Management fads such as TQM and knowledge management are knee-jerk reactions to change. Processes such as TQM, business process reengineering and knowledge management are temporary solutions for organizations that need help from others to think.

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DG's Skates on firm ground

"Skates on thin ice with DG users" [CW, June 5] overstates the North American Data General Users Group's (NADGUG) concern. NADGUG has enjoyed a productive relationship with Data General for many years. As part of our charter, we regularly present the concerns and ideas of our membership to Data General's management. Other than the timing of the meeting, this was no exception.

Data General President and Chief Executive Officer Ronald L. Skates is definitely not on "thin ice" with us. We believe that he has done an admirable job of leading the company through a difficult transition to open systems over the past six years. We are fully confident that the future direction chartered by Data General's management team will be in the best interest of its users.

Steve Pounds
President
NADGUG
Sudbury, Mass.

Take initiative and seek opportunities

Poor Jay Kalter. He worries that his company will "forget to train him" as the company migrates to newer technologies ["Nonmanagement IS: Give us a chance!" CW, May 29].

So what. Kalter and millions like him must learn that training and advancement are their personal responsibility.

Has Kalter tried to learn these new technologies on his own? Has he enrolled in courses at a local college, read the appropriate books or purchased his own computer and software?

Even if these are beyond his financial reach, has he asked his employer if he can work with the newer technologies on his own time after hours? His lack of training may even be because his company just doesn't know he wants it.

Companies are neither parents nor social workers — they owe employees payment for services rendered, nothing else. Anyone who believes different is terribly naive.

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■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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Lighten up! 'Net cruisers find gold

Ellis Booker

That hugaboo about the risks of giving Internet access to IS staffs is going the way of debates about the wisdom of replacing slide rules with handheld calculators.

The worry, articulated several months ago by some conservative CIOs and like-minded consultants, was that staffs would fritter away valuable company time on the dubious, nonbusiness content to be found in cyberspace.

The Internet, they warned, was more about dirty pictures and pointless surfing than any legitimate business use.

That was then. This is now.

As the Internet has evolved at warp speed, and as businesses large and small have raced to get beachheads in this promising global infrastructure, management has begun to accept the compelling argument that Internet access is *de rigueur* for employees building information systems and networks. In fact, even the best and brightest will admit the Internet has supplied some important pointers.

Savvy IS staffs exploit the Internet as a 24-hour source of technical and business help.

"It's a 24-hour help desk," says Richard Costolo, a software architect at Andersen Consulting in Chicago. Costolo is currently building a point-and-click training system with Hypertext Transport Protocol (HTTP) servers.

While Andersen is certainly no slouch at designing computer systems, Costolo says there was little in-house experience in the Common Gateway Interface (CGI), which connects HTTP servers to other resources such as relational databases.

"We quickly found that somewhere, somebody was working on the kind of CGI script we wanted," says Costolo, who found in the global Internet community loads of expertise and a willingness to share know-how.

At Choice Hotels International in Phoenix, which recently became the first hotel chain to offer Web access to its production reservation system, Internet access has been actively promoted since 1991.

"Some of our best programmers are also our most avid Internet cruisers," says Gary Thomson, vice president of computer operations and technical support at Choice. A results-oriented manager, Thomson says that what really matters are projects being completed on schedule and on target. "If they aren't getting their work done, we'll know that soon," he says.

Make no mistake: Dirty pictures and other oddities exist on the Internet, and they are accessed by engineers, software analysts and even CIOs. But that occasional stop at a SONIS (Silly or Novel Internet Site) is part of what makes the Internet so compelling to users and application developers alike. Take away those novelties and cyberspace begins to look like the status quo, with less innovation and entrepreneurial gusto.

Honestly, there are so many exciting and relevant business developments on the 'net — from discussion groups about Hypertext Markup Language authoring tools to vendor product news to the bumbling first efforts of competitors' home pages — that an enthusiastic employee will have little time left for exploring nonbusiness subjects during working hours.

This last point is underscored by the experience at Choice and Andersen, where the Web projects were initiated by employees who cruised the 'net and saw within its vastness inventive ways to deliver value to their employers.

Booker is *Computerworld*'s senior editor, electronic commerce. His Internet address is ellis@cw.com

Software selection demystified

Michael W. McLaughlin

If you had a crystal ball that could predict the issues you would face in your software selection project, what would it tell you? I recently was asked that question by a manufacturing client who was concerned about the pace of software selection, the risk of poor decision-making and, of course, cost.

While fortune-telling is not part of my job, I did share with him a set of guiding principles to reduce the mystery, uncertainty and risk of software selection projects. The most critical point, of course, is to begin with a compelling business case — one that establishes the business imperatives and outlines the estimated costs and expected benefits — in order to build consensus.

Next, plan your strategy early. Envision the selection process as a car trip: Before setting out, make the significant decisions about where to go, how to get there and how much to spend. Then, for optimum results, empower a small, full-time, cross-functional team of "A" players to complete the process.

The "secret" to success, however, frequently escapes those in the driver's seat. Why? Because most teams fail to accept two realities. First, today's leading software offerings usually meet most business requirements. And second, less than 50% of the planned features will end up in the implemented systems, regardless of the upfront analysis.

The most successful teams recognize these realities and then organize for speed and results. They adhere to the following guidelines:

● **"Time-box" the project.** Once the team is focused, delays in decision-making and schedule slippage can be avoided with a nonnegotiable time frame. The time box also establishes an early management discipline that accelerates project completion.

● **Avoid a request for proposal like the plague.** A written response to a list of software requirements provides limited value. Instead, prototype your requirements on a vendor's system. By seeing the software operating in a simulated environment, team members will know immediately whether or not they have a solution.

Avoid an RFP like the plague. Instead, try out the software on a prototype system.

● **Narrow the field quickly.** First, examine each vendor's scope of offerings, technology platform, proposed budget and industry fit. Next, analyze the vendor's ability to support major functions and high-priority needs. Last, complete a detailed modeling and analysis of the software functions. Most important, methodically eliminate candidates at each phase to quickly focus the team on the viable systems.

A few words of caution. Don't buy futures. As a general rule, don't decide on software based on promises of future releases, and don't count on any functionality you haven't seen. Consider futures only for "nice to have" features.

● **Get all the costs on the table.** One client who failed to account for user training, change management and the process redesign effort discovered that these oversights doubled the project and budget. Other frequently overlooked components are IS skills training, legacy system integration, customer education and software enhancements.

The selection process isn't easy, but it is manageable. And, if you observe the principles noted above, you won't need a crystal ball for guidance.

McLaughlin is a management consulting principal at the San Francisco office of Deloitte & Touche LLP. He specializes in leading large-scale technology and operations improvements projects for manufacturing and retail clients.

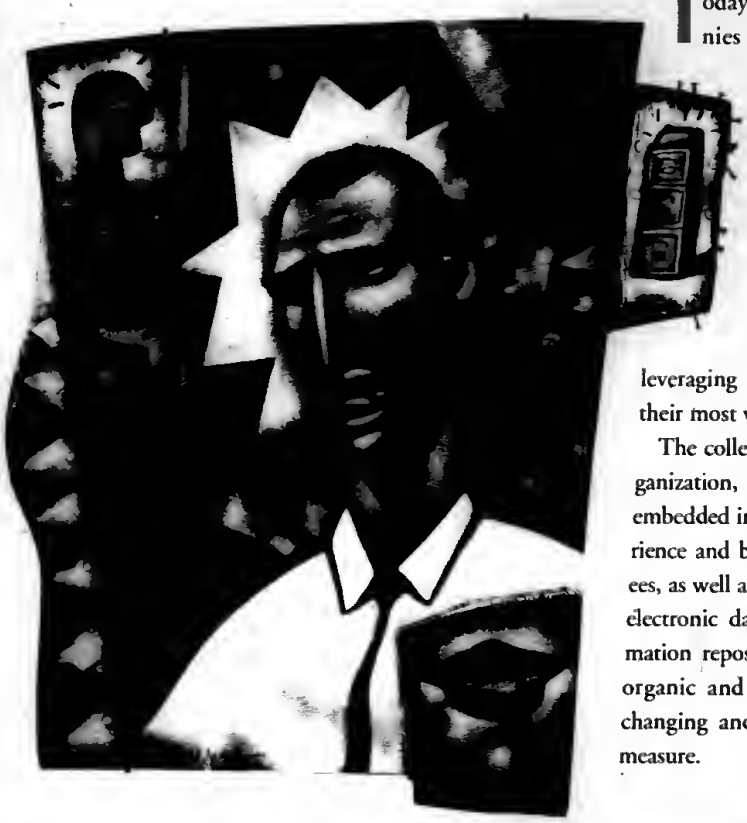
JUNE 19, 1995 • VOLUME 1 ISSUE 5

COMPUTERWORLD

·Leadership Series·

Knowledge, Information, Learning and the IS Manager

By Christopher Gopal and Joseph Gagnon



Today's well-managed companies are making remarkable strides in getting the most out of their people, technology, capital and other organizational assets. But even the most successful companies remain, at best, naive, and at worst, negligent, in managing and leveraging what is almost certainly their most valuable asset: knowledge.

The collective knowledge of an organization, its intellectual capital, is embedded in the personal skills, experience and brainpower of its employees, as well as in its processes, policies, electronic databases and other information repositories. Knowledge is an organic and intangible entity, ever-changing and virtually impossible to measure.

IN TODAY'S SERVICE-ORIENTED, information intensive economy, intellectual capital is a critical resource that can help companies forge sustainable, renewable competitive advantages. Like financial capital, it must be accumulated, cultivated and managed in an active, thoughtful way. But unlike financial capital, it is routinely squandered by even the most competent firms.

Most senior executives readily admit that their companies probably use only a small portion, in many cases as little as 20%, of their potential organizational knowledge. The reason that this valuable asset is left under developed is because intellectual capital can be extremely difficult to find and identify. It's filed away on hard drives, tucked inside desk drawers, or left to roll around inside people's heads.

IS executives can take the lead in tapping their company's bank of knowledge.

The result: 80% of the huge sum of individual knowledge that a company possesses is left untapped, while a relatively small amount of this collective knowledge is actually turned into intellectual capital and put to use.

Recognizing that squandered intellectual capital is an enormous loss, a handful of progressive companies including Bechtel, British Petroleum, Hughes Space & Communications and Monsanto are beginning to manage the vast stores of knowledge within their organizations in a strategic, formal manner.

Some companies are establishing formal knowledge management functions and assigning executives from line groups or relevant support groups to lead them. The Canadian Imperial Bank of Commerce, for example, has created the position of Vice President, Learning and Organizational Development; Dow Chemical now has a Director of Intellectual Asset Management; and Ernst & Young has a Chief Knowledge Officer.

Other companies, like General Motors and Hewlett-Packard, are relying on visionary CIOs to expand their responsibilities beyond mere information technology. They are taking on the broader challenge of improving the way in which their companies manage and leverage organizational knowledge.

Indeed, knowledge management is a promising new area where IS executives can re-establish a leadership role within their organizations; roles that have been diminished over the past several years by a host of technological and organizational factors. To ensure a place at tomorrow's corporate table, IS managers should focus on managing and supporting three distinct but highly interrelated areas:

- **Knowledge**, or intellectual capital
- **Information**, which is the raw material of knowledge
- **Learning**, which is the process of refreshing and updating knowledge

KNOWLEDGE MANAGEMENT

Effective knowledge management, like effective management of any kind, starts with a strategy. An organization can begin to define its knowledge management objectives only with a clear idea of what the business as a whole is attempting to achieve. As part of this initial strategic planning process, companies must answer three questions:

1. What categories of knowledge are needed to support the organization's overall business strategy?

This critical first step requires a comprehensive review of the company's value chain to determine which departments and activities are most critical to the success of the business, and how an enhanced knowledge-base might add value to these vital departments and activities.

A domestic manufacturer, for example, that is looking to break into international markets needs to recognize there will be new knowledge requirements to understand how distribution is accomplished in various regions around the world. Likewise, a publishing company that recognizes its future growth lies in various new emerging media will need to fill gaps in its technological knowledge. These gaps are created by entering a new market. Even a firm whose strategy is not dramatically changing must fully appreciate how knowledge fuels its existing business to keep up with those companies that are capitalizing on their knowledge resources.

2. What is the current state of the company's knowledge? The company should examine how it currently assesses knowledge; understand what role knowledge

Cover and inside illustration by Joe Ukleweg

plays in the overall business strategy, locate important knowledge that exists but has not yet been tapped, and identify "knowledge gaps" – that is, knowledge that is important but cannot be found within the organization.

The above publishing company, for instance, may find that it has many knowledge strengths, such as content familiarity and editing skills, that can be migrated to support its new market strategy. But, at the same time, it may discover it has real shortfalls in electronic design or complex project management as it moves from the printed page to electronic media.

3. How can knowledge gaps be filled? Finding ways to transform the company's current knowledge base into a new and more powerful one is the central challenge for new knowledge managers. And it may just be the area in which IS leaders have the most to offer. Because closing gaps is primarily achieved by connecting knowledgeable people from both inside and outside the company, IS leaders can draw on their established networking skills and use their traditional cross-functional roles to give them unique perspectives on effective knowledge-base solutions.

In one case, an architectural/engineering firm found itself under pressure as clients began demanding fixed-price contracts instead of traditional cost-plus arrangements. The firm needed to ensure more predictability and efficiency in its design and construction projects. It was clear that project teams working independently weren't benefiting from each other's experience.

A group of executives, including the IS manager, was formed to implement a knowledge management process that would allow project teams, at the point of making key design decisions, access to the relevant cumulative intelligence from inside and outside the organization. The company's knowledge management process is highly effective, because it focuses on key decision points, making the knowledge easily accessible through a firmwide computing and communications infrastructure at the precise moment that it is needed.

FIVE STEPS TO BETTER KNOWLEDGE MANAGEMENT

MANAGING KNOWLEDGE at the organizational level lets people benefit from knowledge that comes from the experiences of others, both within and outside the organization. To successfully manage knowledge, focus on five tasks:

GENERATE KNOWLEDGE. This includes the creation of new ideas, the development of new processes, the recognition of previously unseen patterns and the synthesis of separate disciplines. Organizations that excel in generating knowledge reward innovation, encourage experimentation and reflection, and put new knowledge to work as it is generated.

ACCESS KNOWLEDGE. Knowledge remains isolated and essentially useless unless it is easily accessible. Companies can improve accessibility by providing locational tools, ranging from the simple (networks that direct people to other more knowledgeable people) to the elaborate (computerized databases and search tools).

REPRESENT AND EMBED KNOWLEDGE. To capture the knowledge of an individual and turn it into an organizational asset, companies must recast knowledge in a form that can be shared in a number of ways, such as training manuals, videotaped presentations or expert-system software. These techniques will preserve the knowledge of key individuals, even if they leave the company.

FACILITATE KNOWLEDGE. A company must create a culture that overtly emphasizes the important role that knowledge plays in day-to-day business success. What's missing in many organizations is a straightforward articulation of the role and value of knowledge. As a result, experienced individuals often take the knowledge they possess for granted, failing to share it with less experienced people.

TRANSFER KNOWLEDGE. Companies are using a wide variety of new teaching methods tailored to individual learning styles, that transfer knowledge and lessons learned from one part of the company to others. But keep in mind that to make knowledge transfers worthwhile, companies must consider whether the success of one department or product line can be replicated in another. In today's global economy, companies must be sensitive to whether knowledge and processes that make sense in the United States will also work in Europe or Asia.

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INFORMATION MANAGEMENT

The nuts-and-bolts job of managing information — the raw material from which knowledge is produced — is also a critical task for companies seeking to optimize their intellectual capital. This raw material must first be identified and then extracted from myriad sources both inside and outside the organization. Then the information needs to be "coined," or captured, and represented in a form that can be shared, updated and applied in areas of the organization that need it most.

To manage information effectively, IS managers should concentrate on five tasks:

1. Setting goals. The business strategy and business are the best places to start for determining what information is actually important. Frito-Lay wanted to keep the focus of the company on account profitability, so it set a goal of updating actual sales-by-store at the end of every business day.

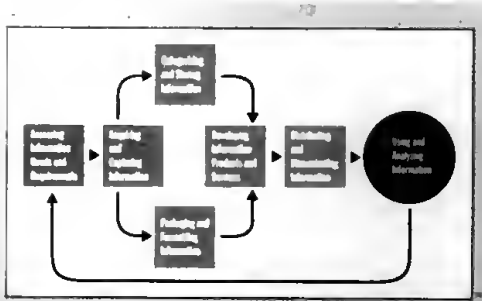
2. Defining processes. Information management, like other management areas, can be defined as a set of generic processes. (See "A Process Model of Information Management" at right.) Xerox made information management, among other processes, more real and possible by articulating it in such terms. This enabled Xerox to provide an infrastructure that allowed its various quality and re-engineering initiatives to work toward the same goals.

3 Building infrastructure. Of course, computer and communications technology will represent the largest and most expensive portion of the infrastructure in most organizations. But as Jane Linder, director of business development at Polaroid, has proven, a full-blown information infrastructure also includes documents, human networks and other non-IT elements. As she has explained in a paper with Thomas Davenport, director of the Information Management Program at the University of Texas at Austin, information management is an unrealistic challenge unless supported explicitly by an infrastructure composed of people, process and technology.

4 Motivating and rewarding people. No attempt to improve information sharing will succeed if the people involved are still encouraged by rewards and compensation to hoard. At Ernst & Young, a part of each consultant's compensation is contingent on "knowledge sharing" activities. The firm hopes to dissuade individuals from viewing personal knowledge as an asset to be guarded.

5 Measuring results. If measuring IT value is difficult, that challenge is compounded when the subject is more general information. The best way to proceed is to attach milestones and feedback mechanisms to information management projects and document even anecdotal evidence that goals are being met.

For example, one of the world's leading computer companies recently put its information management efforts to task. Executives were skeptical about whether they had the most reliable and up-to-date market information for making strategic decisions. To address this issue, the company dedicated a group of information special-



A PROCESS MODEL OF INFORMATION MANAGEMENT

Assessing information needs and requirements. Identify what information should be available to managers and decision-makers.

Acquiring and capturing information. Implement mechanisms that can capture and continually update information.

Categorizing and storing information. Determine whether the information has a natural structure that dictates how it should be categorized and stored, and whether decision-makers can and will use it.

Packaging and formatting information. Decide how the information should best be packaged and presented (e.g. book, videotape, computer disk) to ensure it is useful for potential users.

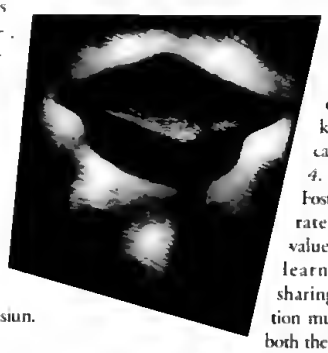
Developing information products and services. Be proactive in filling gaps in the organization's knowledge base by creating new products and services, such as industry reports and new software tools.

Distributing and disseminating information. Get information to the right people through the use of computer and communications technology, speeches, seminars, printed publications and other medium.

Using and analyzing information. Examine how users actually use the information to improve content, access and other aspects of information in the future.

ists to gather and make sense of all the competing, overlapping and sometimes contradictory information being disseminated.

The results? A much more confident management team that is able to reach consensus when it makes decisions. One key element to this success was the ability of the IS force to bridge the gap between technology and how people use the technology. In fact, now an IS specialist participates in every strategic planning session.



LEARNING MANAGEMENT

Companies that have built competitive advantages through effective knowledge and information management must continuously refresh and update their intellectual capital. This is the process of organizational learning.

Like individuals, organizations learn from experience — they try something, note the results, and internalize them — but at the organizational level, this process is far from automatic. IS managers can make it by focusing on the points detailed below:

1. Constant experimentation. No learning can occur in an environment devoid of risks. IS managers know that the risks of experimentation can be mitigated by an ability to rapidly prototype and test new propositions. This expertise can be shared with knowledge workers, offering them a time-tested paradigm for effective organizational learning.

2. Careful measurement. What results did the experiment yield? Outcomes must be quantified and documented for the company to learn what works.

3. Broad communication. Communication is crucial. Without it, learning stops at the individual level, and any new knowledge fails to become an asset that the entire organization can use. IS managers are already expert at the tools that support broad organizational communication; they are uniquely qualified to encourage this kind communication.

4. Socialization. Fostering a corporate culture that values and rewards learning and the sharing of information must be done on both the individual and organizational levels. This type of culture can be achieved in various ways, but one of the most interesting considerations is the cultural impact of groupware, such as Lotus Notes. Groupware may not introduce teamwork overnight to a firm steeped in internal competition, but it encourages collaboration.

SUCCESS FACTORS

To ensure success, the IS manager must be able to show top managment how knowledge management objectives are closely aligned with overall strategic goals, like reducing time to market, lowering research and development costs, and boosting manufacturing productivity. IS leaders must become involved with many different facets of the company to identify the wide variety of needs. A management team concerned with product innovation, for example, will gladly listen to ideas for developing new knowledge that supports its concerns. Firms that thrive on the ability to replicate success will value proposals for sharing best practices.

Strong and consistent leadership is another critical success factor. Companies that have achieved the most success in knowledge management are typically those that have appointed a senior-level executive to assume the mantle of full-time chief knowledge officer. In this dedicated role, the chief knowledge officer can concentrate exclusively on knowledge initiatives and focus on organizationwide knowledge issues that may cut across many departments, functions and processes.

Because information technology is almost always a key tool in knowledge and information management, many companies now look first to their IS departments for guidance. For many CIOs and other IS executives, this represents a remarkable opportunity to take an early leadership role in the expanding area of intellectual capital.

But be warned: IS executives will succeed only if they take a broad-minded perspective. That is, only if they see that enhancing organizational knowledge is the ultimate goal, and that information technology is just one of many tools that can help their organizations seize this critical competitive advantage. ♦

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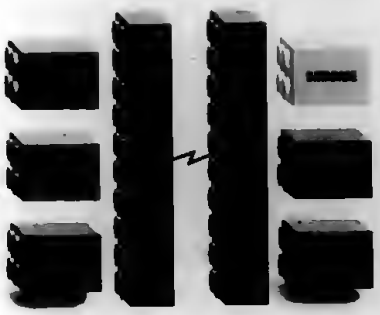

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Corner on the market?

I was concerned with the tone of your article about the acquisition of Legent by Computer Associates ["Voracious CA gobbles up Legent," CW, May 29].

Having used a number of products from both companies over the past 20 years, I find the possible acquisition troubling. CA will now not only have the market for CICS Security with CA-Top Secret and CA-Alert, it will have a corner on non-IBM disk and tape management tools with CA/DYNAM and EPIC.

Having spent a considerable amount of time using Legent's XCOM to communicate among our multiple platforms, I am also concerned about its future in the CA-Unicenter-only approach.

If this merger goes through, service and price are a concern as well as the lack of competition.

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Delphi has its place

I strongly support the viewpoint of Robert Camp in his May 29 letter, "Visual Basic ruas second to Delphi." I do not think the enormity of the revolution Borland's Delphi is fomenting has been made clear.

I well recall the excitement of buying Borland Pascal Versioo 1 0 fnr $49. It was the first compiler t could afford. Delphi is similarly bringing a state-of-the-art, nbject-oriented, rapid application develop-ment product into the homes of thousands of people who could never afford Powersoft's PowerBuilder and are too computer savvy for Microsoft's Visual Basic.

Delphi captures the hearts and souls of its users. By contrast Visual Basic, although a profitable product to be trained nn, is joyless to use.

Robert Glover
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Did you mean RAM?

"IBM's Internet for Windows drives well" [CW, May 22] states, "The TCP/IP and other drivers claim nearly 70K bytes of hard drive real estate — more than enough to crash some DOS programs." Any program that crashes when you install 70K bytes on your hard drive I have to see to believe. I suspect thal yon meant it took np nearly 70K bytes of RAM. And by the way, the latest network drivers for Novell NetWare LANs take up 80-plus kilobytes.

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IBM faces battle with uninformed users

Robert Doocey's letter about his troubles with OS/2 installation ["This is a test," CW, May 22] is indicative of the uphill battle IBM faces. How does he know OS/2 installation is a "nightmare" if he didn't eveo have the correct-size disks?

He says he doesn't understand why the installation process cannot be launched from the currently installed version of OS/2. That works for application software but not operating systems. I am sure Microsoft's Windows 95 will work this way as well.

Richard Maranville
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Thanks for standing up for IS staffers

t completely agree with the need to retrain IS staff rather than "trash" them ["Retrain, don't trash," CW, May 22]. I have been in the data processing business for almost two decades and have seen a lot of fads come and go. I have also been a victim of downsizing.

A lot nf corporate officers forget to think about who will support corporate systems when their builders are gone. Every system eventually needs support. I also know there is no replacement for experience.

Thank you for your cogent recognition of the real world.

Randal C. Bowling
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Win 95 offers little

Regarding "IS must brace itself for Windows 95 conversion" [CW, May 22], we don't have to brace ourselves fnr anything. Our MIS group has decided that Microsoft's Windows 95 has nothing tn nffer us at this point in time except huge investments and is aot planning to make the change.

Steve Hovland
Graco, Inc.
Minneapolis

Older developers keep up with technology

The dream team of developers in your group photo ["AlliedSignal reinvents IS," CW, May 29] is described as being "mostly thirtysomething." Well you missed a top story regarding the man on the left, Norman Lindenberg, who will be 70 in August.

He puts the lie to the myth that the over-50 generation can't keep up with developments in Microsoft's Visual Basic, C++ and nther microplatform tools. And Norm is still an expert in the old standby legacy languages and databases such as Cobol and CA-IDMS, not to mention VAX and Oracle skills.

So let's keep a lid on this generational pigeonholing of data processing professionals. It does a great disservice to many in the industry tn imply that you've got to he young to he good.

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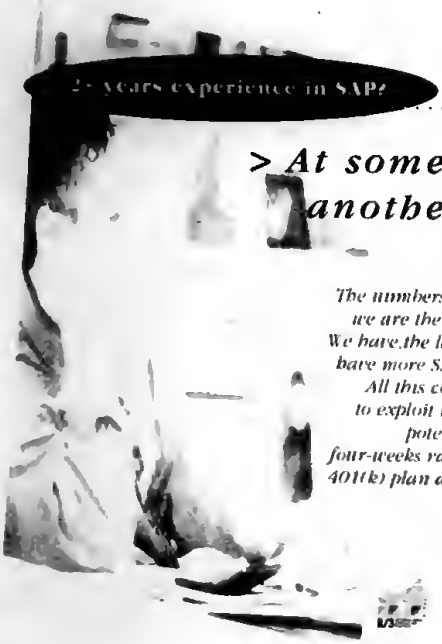

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Microsoft puts high price tag on Windows 95 support

By Stuart J. Johnston

Along with delivering its "everything-but-the-kitchen-sink" operating system, Microsoft Corp. is changing its technical support policies. And that may prove expensive for some users.

Windows 95 buyers will still receive 90 days of free phone support for the basic operating system, but users with networking problems will have to call a special "pay" number. Calls will cost $1.95 per minute, with a cap of $35 per call, Microsoft officials said last week.

Two large user sites did not foresee a problem: One already pays for an enhanced technical support contract, and the other has a high degree of internal support.

Microsoft technical support plan for Windows 95

Product	Cost and terms
Basic operating system	Free for 90 days (measured from first phone call)
Networking	$1.95 per minute to a cap of $35 per call (no free grace period)
Desktop applications (including Office 95)	Free – no time limit

Support costs

One large user with a support contract said some users would be better served if Microsoft allowed them a few free networking calls before the support charge kicked in.

"They [Microsoft] should give the person at least a week," said Briscoe Stephens, coordinator for space sciences in the Advanced Scientific Information Systems group at NASA in Huntsville, Ala. "[I don't] like the idea of picking something up and not having questions answered without having at least a few free calls." For example, they could give the user "five free problem calls."

The $1.95 per minute charge will not begin while the user is waiting on hold, a situation likely to be common on Microsoft's support phone lines in the first weeks after Windows 95 is released. The clock will start running when the user is actually connected to a support technician, said Linda Glenicki, general manager of end-user support at Microsoft's Product Support Services group.

Company officials argued that most other companies in the industry charge for networking support.

"It's a little surprising that they would start charging for networking support," said Brian Moura, assistant city manager for San Carlos, Calif. But the city tends to handle networking support itself, he said, so he did not foresee serious problems with the change. As before, Microsoft does not have a toll-free number for its support groups, so long-distance charges are in effect for any nonlocal calls. Production Support Services is available from 6 a.m. to 6 p.m. Pacific time, Monday through Friday.

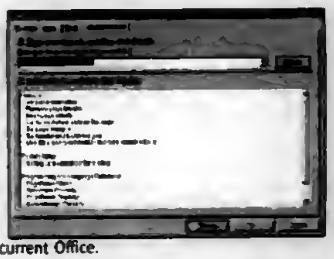
Technical support for desktop applications will continue to be free, officials said.

Office 95 preview

Microsoft's Office 95 application suite is due to hit retailers' shelves within 60 days of Windows 95's release, now scheduled for Aug. 24. *Computerworld Norway* reviewed a beta copy of Office 95 and offers the following highlights:

■ Office 95 eases management of large multidocument projects through a new file type called a binder. A single binder file can contain groups of Office documents relating to a single topic (left part of screen). Documents are launched into the work space through a single mouse click. Binders can also be mailed or saved to a floppy disk as a single file.

■ A new help system supports English-like queries such as "How do I turn the page when I print?" Answers are based on probabilistic hits. Office 95 provides screen shows for the most frequently asked questions, grabbing the user's mouse pointer and stepping through the command sequence. The manuals have been reduced to 600 pages from 4,000 pages in the current Office.



■ A new background indexing engine indexes all Office and ASCII files for quicker searches. For example, a search for the word "quality" in a directory with 70M-byte files took only 2 to 3 seconds. Basic Boolean searches are also supported.

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Overwhelming, perhaps?

Digital's cross-platform box might be a little much for users – at least, not many are buying it yet

By Neal Weinberg

Six months after the splashy debut of Digital Equipment Corp.'s multiclient desktop, customers are still mulling Multia.

The product's strength — the ability to access legacy, Unix and PC applications from one Alpha-powered box running Microsoft Corp.'s Windows NT — has been something of a puzzle to users whose first response is to try to fit Multia into a neat category.

Multia is not exactly a PC, a workstation or an X Window System terminal. "To me, it's both a floor wax and a dessert topping," said Terry Shannon, an analyst at Illuminata in Hollis, N.H.

Brian Stamm, president of Sherlock Systems, Inc. in Buffalo Grove, Ill., a Digital reseller, said he is impressed with Multia. "It's got the fastest processor in the world, and it runs virtually anything," he said.

But Stamm acknowledged that the broad capabilities of Multia tend to overwhelm customers, who come in with "a simple PC mind-set." He added, "It's a little more sophisticated than a typical user can appreciate."

Pat O'Connor, senior corporate marketing manager for North America at Pioneer Standard, a Digital partner in Cleveland, said that when the full cost of ownership is calculated, Multia beats a PC "hands down."

Despite their enthusiasm for the product, Digital's resellers concedo that sales have not exactly shot through the roof. And they are laying the blame on Digital marketing.

"It has been a very, very slow process," said Rosa Giles, a senior systems engineer at George S. Olive & Co. in Evansville, Ill., a Digital partner and reseller. "One of the big reasons has been the advertisement. Relative to the capability and cost of it, the advertisement has just not been there. It has almost been a quiet item within Digital."

"It's going slowly," said Paul Bihuniak, an account executive at Computer Peripheral Resources, Inc., a Digital reseller in Natick, Mass. "Everyone believes they just need a PC with an X terminal emulator."

Multia multiclient desktop

Processor:	233-MHz Alpha
Operating system:	Windows NT
Hard drive:	528M bytes
Memory:	24M bytes; expandable to 256M bytes
Key features:	Runs PC applications, Unix-based workstation and legacy applications
Price:	$4,995

For example, Paul Beck, manager of information processing at Manitowoc Engineering Co. in Manitowoc, Wis., is a Digital Alpha server customer who uses PCs and runs emulation software to access Unix applications. Beck said he was not familiar with Multia and did not think he needed it.

But Bihuniak said Multia, because it was designed to run Unix applications, offers much better performance. "The hardest sell is to convince people that it is integrated [and] that it's perfect for Unix applications and DOS applications," he said.

Bihuniak said he would like to see Digital do a better job pitching Multia. "The marketing is a little weak," he said.

Digital said it had expected a six-month period in which customers kicked Multia's tires before they made purchase decisions.

Eileen O'Brien, an analyst at International Data Corp. in Framingham, Mass., agreed that Multia is a "sound product" that is undergoing some natural growing pains. Both Giles and O'Connor said they are starting to see the beginnings of Multia momentum. Digital recently upgraded the Multia chip to 233 MHz and added software that boosted Multia's ability to handle Unix applications. Shannon said Digital is expected to add a 266-MHz chip to Multia later this summer.

Peripheral Component Interconnect buses

Apple moves Power Macs to PCI

By Lisa Picarille

Apple Computer, Inc. is asking users to get on board with its newest bus architecture or be left behind.

This week, Apple plans to roll out its fastest Macintoshes ever. The company will introduce two PowerPC 604-based systems that for the first time depart from Apple's proprietary Nubus architecture and instead sport the industry-standard Peripheral Component Interconnect (PCI) bus architecture.

Selling power

Apple has sold more than 1.4 million Power Macintoshes since the product line was introduced in March 1994.

Wider variety

Apple's adoption of the PCI bus architecture gives users a wider choice of third-party add-ons because developers can now create boards, cards and accelerators that will work with the Macintosh and the PC. But it also means that cards that worked with older Macintoshes will not be compatible with the new systems, said officials at the Cupertino, Calif., company.

"This is Apple acknowledging that in order to compete in the marketplace they have to adopt industry standards, not their own standards," said Chris LeTocq, president of SoftTracks, Inc., a research company in Los Altos, Calif.

Apple's Power Macintosh 9500 series is offered in two configurations — a 120-MHz 604 and a 132-MHz 604. The series includes a 32K-byte cache, 16M bytes of RAM expandable to 768M bytes, and six PCI expansion slots [CW, May 22].

To accommodate the PCI architecture, Apple had to tweak the operating system of the 9500 series. The update of Mac OS, called System 7.5.2 — code-named Marconi — features Apple's Open Transport networking architecture.

Bob Anderson, a senior analyst at A. O. Smith Corp., an automotive parts firm in Milwaukee that has approximately 700 Macintoshes and 200 PCs, said the move to PCI was a good one for Apple.

"We are interested because the 9500s represent a big power jump because of the increased processing speed of the 604 chip. That is a big plus and the real attraction of the machines, especially for people doing graphics and desktop publishing," Anderson said.

The Power Macintosh 9500s are also Open Firmware compliant. Open Firmware is an industry specification that ensures PCI cards will work with both Macintoshes and PCs.

LeTocq said the move to PCI is the first step along the path to the Common Hardware Reference Platform (CHRP), which IBM and Apple are jointly developing. It is expected to let users run seven operating systems.

The 9500s are expected to be available in limited quantities for the first several months. They will be "shipping in volume" by the third quarter, said Dan Limp, product manager at Apple's PC division.

Growing HP, Compaq rivalry to benefit users

By Jaikumar Vijayan

In the hitherto quiet but sharply escalating PC rivalry between Hewlett-Packard Co. and Compaq Computer Corp., it looks like customers could win big.

Last week HP announced a line of aggressively priced Pentium-based PCs. Packed with a range of desktop management capabilities and network-ready features, this line is aimed at lowering the cost of owning and managing networked PCs. The systems start at just over $1,500 and are available immediately.

Stiff competition

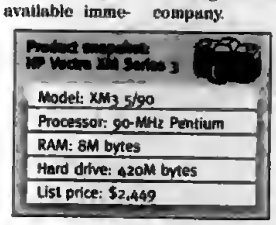
Analysts perceived HP's announcement as a powerful swipe at archrival Compaq, which earlier this year triggered a sudden interest in desktop manageability with its high-profile launch of its Intelligent Manageability strategy [CW, March 13].

Intelligent Manageability is Compaq's broad term for the network and systems management capabilities it has started integrating into its mainstream business PCs.

"Compaq was not the first one out with desktop management [capabilities]. But they were the first to make a big marketing issue out of it. Now HP is striking back" with a similar announcement, said Joe Filazo, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

"Both these companies think they see a real need in the market for desktop manageability, and they both want to be seen as the first to bring it to the user," said Cheryl Currid, president of Currid & Co., a Houston consultancy.

For instance, it is possible to track more than 250 PC attributes, such as serial number, disk space and BIOS and security-related information on the new HP systems using desktop management software. The availability of this data allows for easier asset management and tracking of inventory, according to the company.



The information is also user definable, which means users and managers can "get" and "set" different attributes of a networked PC. This allows users to customize asset information or set certain desktop parameters — such as remotely disabling a keyboard to facilitate repairs.

Similarly, HP has tried to make its new PCs more network-ready. All HP Vectra XM Series 3 PCs will come standard with network interface cards and broad driver support for various network products and operating systems. This, HP hopes, will make it easier to integrate the PCs into a network.

HP will also expand the remote management capabilities of its PCs by integrating its desktop management software with OpenView, its network and systems management platform.

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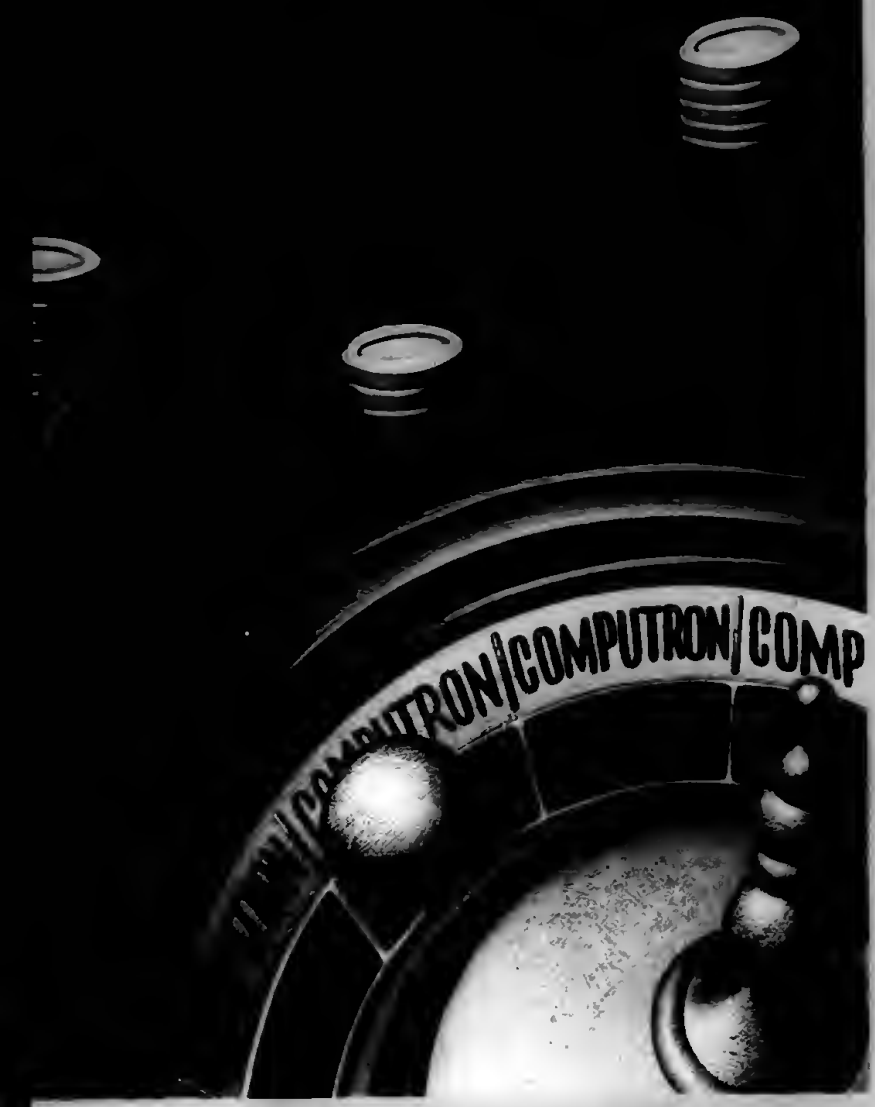

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Intergraph's Jupiter enters orbit

Object-oriented technology links CAD packages

By Jean S Bozman

Intergraph Corp will launch its Microsoft Corp Windows NT 3.5 strategy into orbit this fall with products based on its new Jupiter object-oriented technology.

Using Jupiter objects, Intergraph's Pentium- and NT-based systems will let users link Intergraph's and other vendors' computer-aided design (CAD) software modules into new arrangements of custom-made software packages.

"I'm going to be able to dial XYZ Co for a certain type of finite element analysis [software] and call up another company and ask them for some thermal analysis software," said Thomas Gage, an Atlanta-based computer graphics specialist at Norfolk Southern Corp railroad in Norfolk, Va. The site has 25 Intergraph Pentium-based workstations.

The Huntsville, Ala.-based company will also leverage its extensions to Microsoft's OLE to bring new functions to Intergraph packages.

Strong support

Microsoft is coordinating the meetings of a CAD industry group focused on extensions to Microsoft's OLE middleware. The OLE for Design & Modelling extensions — now a de facto industry specification — are supported by more than 34 CAD software vendors, Intergraph said.

"Applications developed under Jupiter will be software components that work with one another and with Windows/OLE-compliant applications," said Bruce Jenkins, an analyst at Daratech, Inc. in Cambridge, Mass. "It's a framework within which Intergraph will develop application products."

The Jupiter technology, introduced at Intergraph's annual user conference in Huntsville last month, allows users to blend software components. The OLE extensions, which were written by Intergraph, are already supported by 30-plus vendors, including Autodesk, Inc., Cadence Design Systems, Inc. and Structural Dynamics Research Corp.

Using both Jupiter and OLE, a user could drag and drop a three-dimensional wire-frame model of a race car from Autodesk's AutoCAD and place it into an Intergraph modeling package or a Microsoft Excel spreadsheet. That will bring engineering end users into the mainstream of a large corporation's Microsoft document processing, analysts said.

Jupiter's highlights

- Leverages Microsoft's OLE extensions for Design & Modelling
- Shares object-oriented modules between CAD applications
- Intergraph will ship this fall Imagineer Technical as the first Jupiter-based two-dimensional drawing package
- Works with Microsoft's Windows 95 and Windows NT
- Windows-based Jupiter applications share files with Intergraph's Unix applications
- Jupiter will be the basis for Intergraph third-party CAD application development

Intergraph will ship a series of Jupiter-based products this fall, starting with the Imagineer Technical two-dimensional drawing package. But if enough CAD software vendors support Intergraph's OLE extensions, Intergraph users will be able to pick and choose from a wide variety of CAD software modules next year.

Intergraph will provide software that links Jupiter applications with those on Intergraph's older Unix RISC systems, said Wilson Hotes, manager of CAD operations at Litwin Engineers and Constructors, Inc. in Houston. That includes network connectivity software and a uniform file-format support for Unix and NT, he said.

The company has 120 Unix-based Intergraph workstations and four of Intergraph's NT-based TD4 machines.

Industry analysts say the movement of key Unix-based CAD packages to Windows NT platforms may cause prices to drop. However, Jupiter's appearance may also provoke pricing changes, said David Weisberg, publisher of "Engineering Automation Report" in Englewood, Colo. "Jupiter is not freeware," he said.

Intergraph said software developer's kits will be priced at $900, and the company will charge runtime licenses for applications built on Jupiter technology.

Guide ranks sales software

By Mindy Blodgett

Facing the dizzying array of software that supports sales force and marketing automation is a daunting task for beleaguered information systems managers.

So the fourth annual *User Guide to Sales, Customer Service and Marketing Automation*, produced by consulting firm Information Systems Marketing, Inc. (ISM) in Washington, could come in handy for a company considering automation.

For Mark Bahadur, a marketing analyst at Hancor, Inc. in Findlay, Ohio, a company that sells drainage pipes to construction projects, sales force automation is definitely a wave his company wants to catch.

"We think we need to automate to become more competitive and productive," Bahadur said. The company has had problems getting information from its sales force in the field back to the corporate office, he added.

Bahadur said he was not looking forward to facing the onslaught of software vendors. "That's why a guide like this is helpful," he said. "And that is why we hired ISM to help us. The software market is very confusing, and somehow you have to cut through the clutter."

More than 200 packages tested

A team of four ISM analysts spent eight months testing more than 200 software packages. Barton Goldenberg, president of ISM, said the team evaluated each product for business functions, user friendliness and support and technical features.

The team then anointed the Top 15 offerings by assessing business functions, technical features, and user friendliness and support in three separate tests.

According to Lise-Lottedahl, the ISM marketing analyst who led the team, the testers observed several trends in software development.

Products increasingly adhere to industry standards, including Open Database Connectivity, Lottedahl said.

ISM offers three versions of the guide, which cost from $495 to $1,495.

Top of the class

Out of a possible score of 80, the following sales force automation packages scored the highest based on various business functions:

Brock Control Systems' TakeControl series	78
Information Management Associates' Telemar	76
Data Systems Support's SIRS	76
Marketing Information System's MSM	75
Data Code's Enterprise series	74
Aurum Software's SalesTrak	74

Source: Information Systems Management, Inc., Washington

Electronic record system delivers speed for FedEx

By Tim Ouellette

Even with the growth of computer technology to track information, FedEx Corp. thinks your signature is still the best way to verify that it has delivered a package.

To that end, the Memphis shipping company, with the help of workflow software vendor IA Corp., rolled out the Electronic Delivery Record (EDR) system last week.

EDR lets FedEx enter and track signature images for package receipts (see chart), improving response time when customers want to verify that a package was sent to the right person.

"We were looking to take advantage of technology to provide better proof of delivery," said Robert Carter, vice president of corporate systems development at FedEx. "We needed to provide signatures in an advanced way."

FedEx provides this type of informa-

FedEx, *page 56*

FedEx's Electronic Delivery Record

By automating the capture and storage of signature image files, FedEx improved customer service and expects savings in time and labor costs

Before:
- Recipients signed for each package delivered
- Couriers wrote delivery addresses by hand
- One week was needed to respond to proof of delivery requests

With EDR:
- Courier needs only one signature and swipes bar code for address information
- System scans in 1.2 million signature images per day
- Proof of delivery process completed in one day

Next:
- On-line access to signature information via the Internet (http:www.fedex.com) and through FedEx's package tracking software

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CONTINUED FROM PAGE 53

tion to its regular customers as a standard service and handles about 2,500 individual requests for proof of delivery a day, he added.

Before, FedEx retained images of signatures on microfiche, which required extra space and more time for retrieval. Now, after the signature image is scanned into EDR, an indexing subsystem of 27 Sun Microsystems, Inc. servers builds a database and migrates the objects to optical storage in 30-day time periods.

At the same time, a signature capture subsystem scans images, manages the workflow and matches signatures with related objects containing the delivery information. Thirty customer service representatives at Unix workstations in Memphis access the system now, faxing documents with the signature image and shipping information to customers. Access for FedEx's 4,000 agents throughout the country is next.

Workflow eases automation

EDR is based on IA's WorkVision workflow engine. Workflow software helps automate the movement of data — in this case, signature images and related delivery data — through the enterprise to employees who need to act on the information.

FedEx previously worked with Emeryville, Calif.-based IA to develop the Domestic Customer Invoicing system, which eliminated paper handling for invoice tracking. IA's background in the aerospace industry and its handling of very large installations helped solidify FedEx's choice.

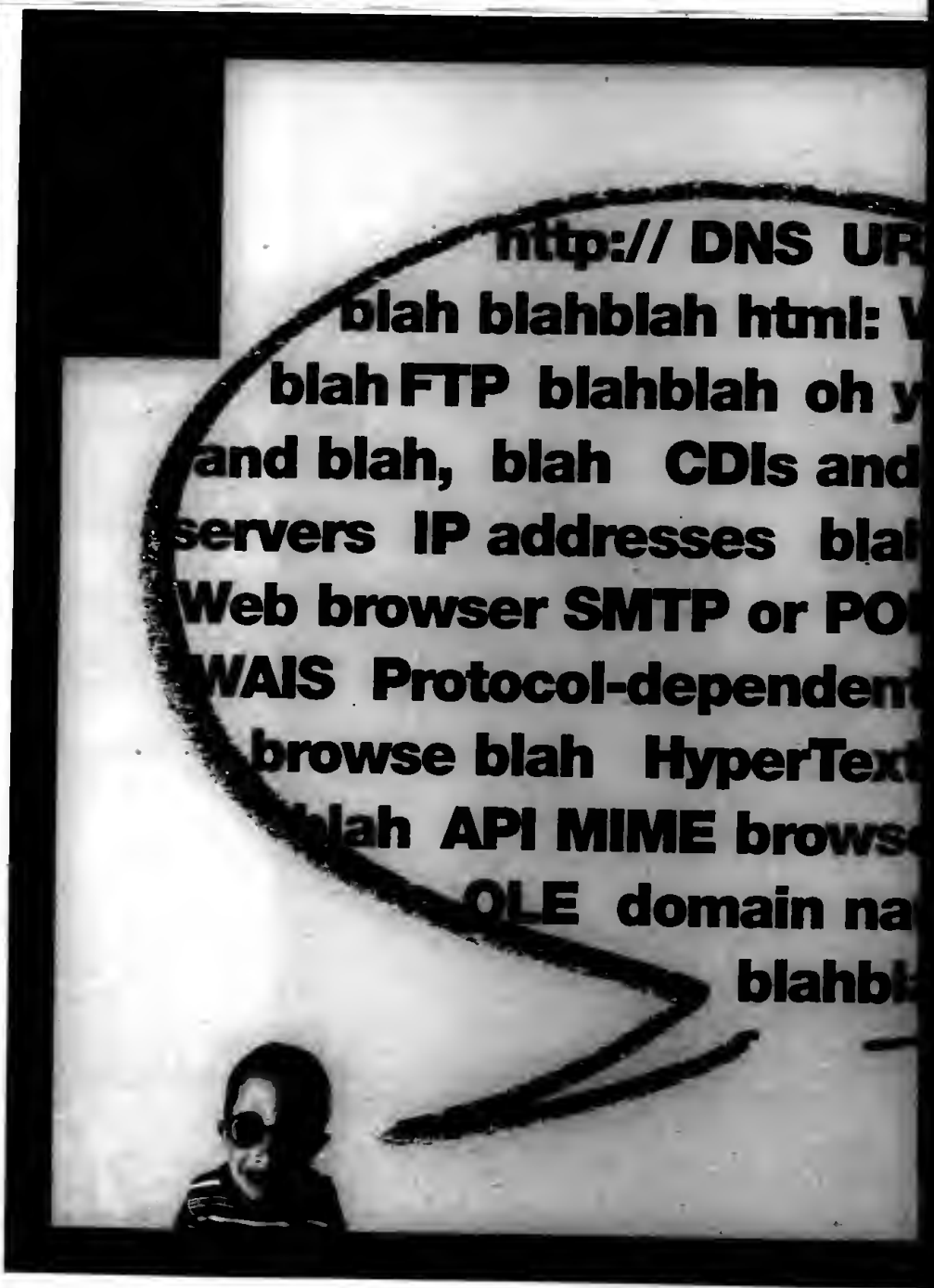
"Because of the volumes we deal with, we were looking for more than a PC-based solution. I'm talking about millions of signature images," Carter said. "Some of [IA's] work with Boeing and others convinced us."

FedEx had "the same heavy-duty need for control that the defense community had," said Steve Weissman, an analyst at Hurwitz Consulting Group, Inc. in Newton, Mass.

Analysts also laud WorkVision's ability to scale up to higher transaction volumes and remote locations. "What is really different about their system is the scalability to distributed enterprise installations" and the ability to change work processes quickly, said Bruce Silver, principal analyst at Bruce Silver Associates in Weston, Mass.

Silver said he considers many other workflow packages to be departmentally bound because they are usually tied to one server and often require custom gateways to expand to the enterprise. WorkVision's workflow engine can be replicated and distributed to remote offices without any extra programming.

IA focuses mainly on financial and service-oriented customers, competing on the high end with FileNet Corp., IBM and Recognition International, Inc. According to Thierry Leger, vice president of marketing at IA, the company wants to stay focused in these areas and provide specialized application frameworks based on large installations, though no such vertical framework based on EDR will be resold.



Brief

Document viewer debuts

A new high-speed document image viewer from Kofax Image Products in Irvine, Calif., provides seamless integration with workflow systems, image databases and document management software from other vendors. Designed for production imaging applications, Ascent ViewManager saves annotations separately from the image file and prevents unauthorized users from viewing an annotation as it moves through the workflow environment. Ascent ViewManager costs $295 per user.

XcelleNet, Sterling connect to ease remote access

Package provides extended data compression

By Mindy Blodgett

Two software players have joined forces to launch a product that eases connections between remote users and the corporate infrastructure.

XcelleNet, Inc. in Atlanta and Sterling Software, Inc in Irving, Texas, will jointly develop Connect:Direct for RemoteWare.

Samuel May, an analyst at The Yankee Group in Boston, called the product "another building element in the tool set for enterprises."

"Companies are in the process of pushing their computing resources further and further out into the field through smaller and smaller pipes," May said. This product will "allow workers in a convenience store in the boonies to connect up to the corporate database in Orlando," he added.

Connect:Direct for RemoteWare will combine elements of software previously available from each vendor. It will offer a checkpoint/restart feature to reduce data retransmission costs if errors occur. If data is interrupted, this feature will notify the user of the error and restart the transmission from the point of the error rather than resend the entire file.

The package will also provide extended data compression and synchronization for moving large files between the enterprise network and remote locations. Far-flung users will be able to communicate with various systems, including 16 versions of Unix, Novell, Inc.'s NetWare LANs and IBM's AS/400 and MVS.

Ken Dulaney, an analyst at Gartner Group, Inc. in Stamford, Conn., said more partnerships such as these are needed to move the cause of remote computing forward.

[redacted]

Btrieve Technologies, Inc. has introduced Scalable SQL 4.0, a client/server relational database.

According to the Austin, Texas, company, Scalable SQL 4.0 lets users write applications that can move from a palmtop PC to a large client/server configuration without modifying the application of the database. It can also manage multiple databases located on different workstations and servers. This lets applications simultaneously access local workstation databases and distributed server databases.

Scalable SQL 4.0 is built on Btrieve's MicroKernel Database Architecture, which gives developers a set of data access modules that can be mixed and matched based on the desired task.

Scalable SQL 4.0 supports workstation engines on DOS, Microsoft Corp.'s Windows and Windows NT and OS/2. It also supports client/server engines for Novell, Inc.'s NetWare and Windows NT.

Workstation engines cost $149 per station. Pricing for server engines is based on the number of concurrent users and starts at $995 for a 10-user configuration.

▶ *Btrieve Technologies*
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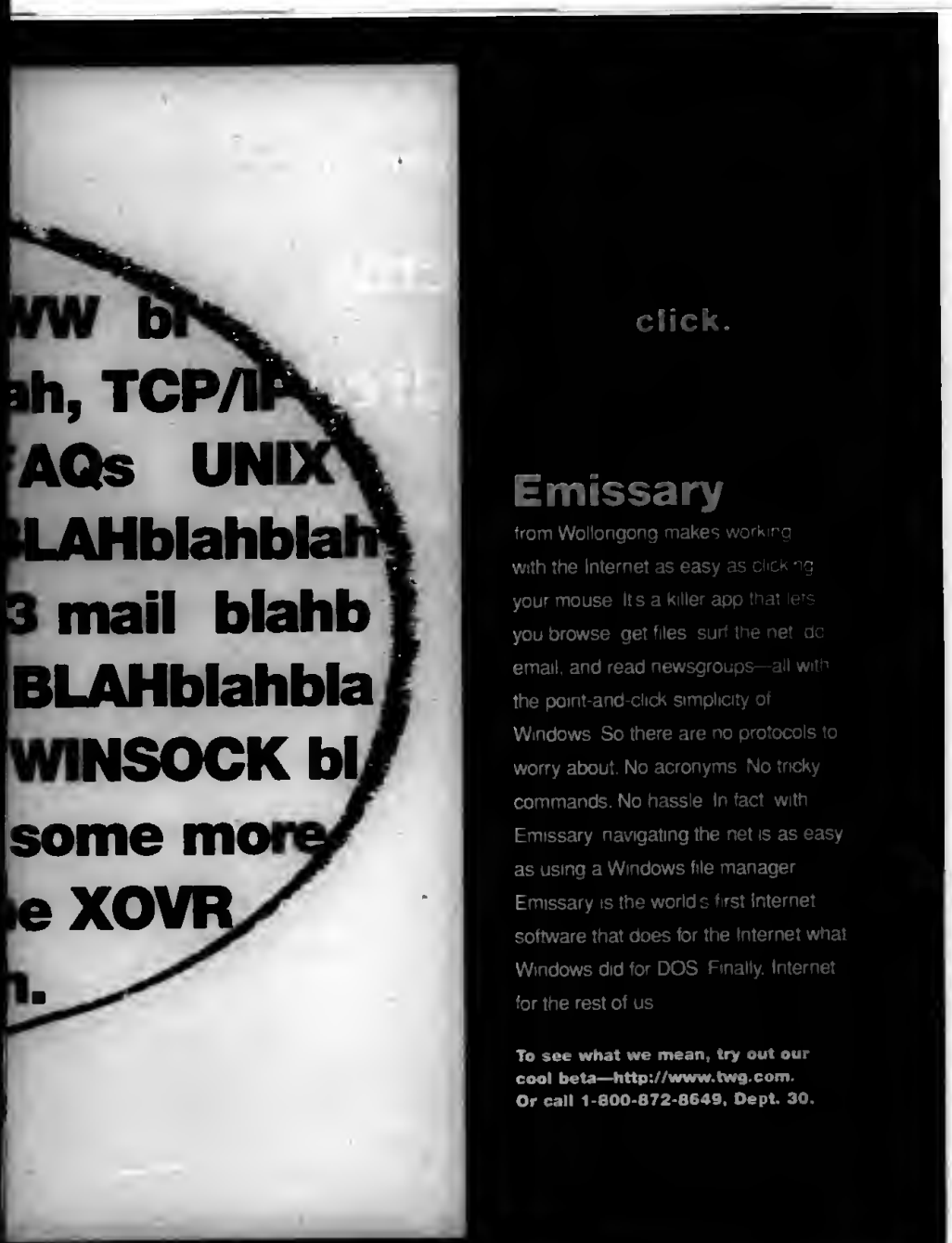

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Support, service are scale-tipping factors

Internetworking vendors fine-tune offerings in response to users' wants

By Laura DiDio and Michael Fitzgerald

Time is money. And nowhere does the old adage ring so true as with a corporate internetwork that requires fast technical support to fix a problem.

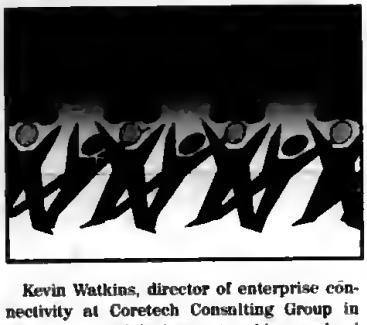
Network administrators know that when there is a problem with their network or — even worse — the network is down, they need immediate help. Hence, technical support is a crucial factor in users' purchasing decisions.

"It's very simple: If our network goes down, we can't work. So if we had a problem and our internetworking vendor didn't provide us with quick, proficient service and support, we wouldn't touch their products again," said Robert Murphy, a network administrator at Cardinal Hill Rehabilitation Hospital in Lexington, Ky.

Such sentiments are the rule rather than the exception. And the "Big Four" internetworking vendors — Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc. and 3Com Corp. — are heeding that message.

All four companies are fine-tuning their support offerings accordingly. They are pledging faster response times and callbacks, lengthening telephone hot line support hours, using online services on the Internet and CompuServe, and providing quicker turnaround for replacement parts and equipment.

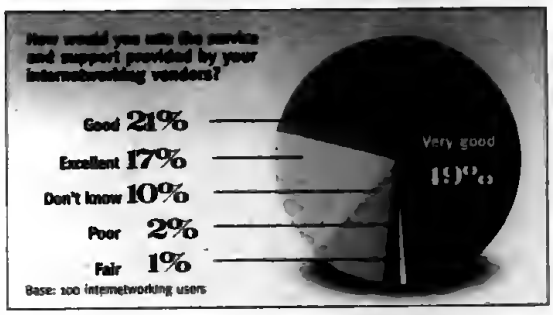
Users and analysts agree that life is confusing right now for even the most technically astute users and network administrators.



Kevin Watkins, director of enterprise connectivity at Coretech Consulting Group in Wayne, Pa., said the internetworking vendors' latest technical support initiatives are critical because today's networks comprise highly complex, multifunction devices that handle tasks such as routing, bridging and switching.

With so many complex components, users often cannot do all the troubleshooting themselves, Watkins noted. "The vendors' [technical support] call logs are huge," he said.

To deal with these mounting support issues, all of the major internetworking vendors have put solid support services in place. Some industry observers suggest that Cabletron and 3Com go beyond the norm by providing free telephone support to anyone calling their toll-free lines, regardless of whether the callers use their respective equipment.



Source: Computerworld survey

About 1,000 of the approximately 10,000 weekly calls to Cabletron's support hot line fall into the realm of "hard-core problems," said Don Jette, the company's manager of technical support. These calls usually last 40 to 60 minutes and result in resolution in 85% of the cases, he said. The remaining 15% of the problems will be duplicated in Cabletron's Hardware Acceptance Lab, and the problem is usually solved within 24 hours, Jette added.

Alan Kessler, 3Com's vice president of customer service, said 3Com has two interoperability labs — one in Amsterdam and another at its Santa Clara, Calif., headquarters — where they reproduce customer technical problems.

Working through the Web

At Cisco Systems, Inc. in San Jose, Calif., support and service are handled as part and parcel of the customer advocacy department.

Cisco relies heavily on on-line support to handle problems through its World-Wide Web page, which is part of its Cisco Information Online effort. Gary Mattevi, director of customer advocacy, said that some 65% of inquiries on the Web page save a call to technical support.

Cisco also follows an open systems model in which it tries to solve problems that crop up with competitors' equipment in mixed-shop environments. "We will not go in and say, 'Sorry, that's not our problem; you're on your own,'" Mattevi said.

Not to be outdone, Bay Networks, Inc. recently announced a complete makeover of its service strategy.

Bay, formed by the merger of SynOptics Communications, Inc. and Wellfleet Communications, Inc., took the best service programs of the two companies and merged them. For instance, Wellfleet's seven-day, 24-hour service is now extended to the whole company.

Also, the SynOptics Advanced Call Delivery System has been adopted, which means 89% of calls go directly to an engineer. Before, 60% of the calls went to an answering service and required a callback.

The company also rolled out a new service program, Bay Networks Service [CW, May 22]. Prominent in this is a remote monitoring service designed to appeal to large users.

Mergers and acquisitions are their specialty

Internet resources abound

By Ellis Booker

Looking for a merger and acquisition candidate? Check out the following resources:

- **The Edgar Project** (http://www.nesa.uiuc.edu/SDG/IT94/Proceedings/Fin/ginsburg/edgar.html).

The fruits of a grant from the National Science Foundation and R. R. Donnelley & Sons Co., Edgar is a financial data archive that has been available to Internet users since January 1994. It comprises forms electronically filed to the Securities and Exchange Commission by publicly traded corporations in the U.S.

Unlike some commercial CD-ROM-based products, Edgar does not include photographic exhibits, and there are no current plans to add this capability.

- **Galt Technology, Inc.'s gigantic list of public companies with home pages** (http://networth.galt.com/www/home/insider/publicco.htm). Galt also offers various other searchable indexes on public companies and mutual funds via its very attractive NetWorth home page (http://networth.galt.com/www/home/networth.html).
- **The Department of Economics at the University of Michigan** (http://alfred.econ.lsa.umich.edu/). This offers more academic information about economics and the economic implications of electronic commerce.
- **QuoteCom, Inc.'s Hoover Company Profiles** (http://www.quote.com/hoov.html). A fee-based service for searching more than 1,000 of the fastest growing companies in the U.S. and the world.
- **Disclosure, Inc.'s Gopher site** (gopher://di.disclosure.com:8000/11/). A fee-based service.

Briefs

Significant stakes claim

Delrina Corp. in San Jose, Calif., took what it termed a "significant" minority stake in Ex Machina, Inc., a wireless messaging and paging software firm in New York. It plans to create software that integrates wireless fax, data, voice and paging for mobile workers.

Data at their fingertips

Banking by way of the Internet just became a reality. San Francisco-based Wells Fargo Bank recently became the first to give customers access to their accounts. Customers, who first must set up a secure password via telephone, can check balances in their checking, savings, line of credit and credit-card accounts. They can also access transaction histories for their checking and savings accounts through the system, which requires Netscape Communication Corp.'s Navigator World-Wide Web browser.

Comdisco expands

Comdisco Disaster Recovery Services has expanded its very small aperture terminal (VSAT) satellite communications for its customers through the installation of a second 6.1 meter antenna from Hughes Network Systems, Inc. at its Wood Dale, Ill., facility.

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Common Gateway Interface Resources

The Common Gateway Interface (CGI) runs external programs, or gateways, under an information server. Currently, the supported information servers are Hypertext Transport Protocol servers.

The most frequent use of CGI today is to allow a visitor on a Web page to access a database. A user enters a page and fills out a Hypertext Markup Language (HTML) form there. The CGI script takes this input, parses it into a valid SQL statement and sends it to a resource such as a relational database. Another CGI script can then format the output of the database query as an HTML document and pass it along to the user for viewing through an HTML browser such as Mosaic or Netscape's Navigator.

CGI primers

- **The National Center for Supercomputing Applications' (NCSA)** starting-place primer on CGI (http://hoohoo.ncsa.uiuc.edu/cgi/overview.html).
- **The Developer's Virtual Library** (http://WWW.Stars.com/) and its very well organized CGI resources page (http://www.charm.net/~web/Vlib/Providers/CGI.html).

For continually updated information on CGI resources, see the Yahoo directory (http://www.yahoo.com/Computers/World_Wide_Web/CGI___Common_Gateway_Interface).

CGI scripts

- **The NCSA at the University of Illinois** (http://hoohoo.ncsa.uiuc.edu/cgi/intro.html). NCSA also maintains detailed information on the CGI specification itself (http://hoohoo.ncsa.uiuc.edu/cgi/interface.html).
- **The CGI Programmer's Reference** (http://www.halcyon.com/hedlund/cgi-faq/)
- **The EIT Webmaster's Starter Kit** from Enterprise Integration Technologies Corp. (http://wsk.eit.com/wsk/doc/). This site includes an alternative set of CGI routines for simplifying the creation of CGI programs.

- Progressive Networks in Seattle received lots of deserved attention for the April 10 launch of its real-time audio-across-the-'net technology, but we only just recently gave the Windows-based RealAudio player a test run. It works! Download a copy (Macintosh or Windows) after filling out a short registration form (http://www.prognet.com/).
- Timothy Leary is described on his own Web page as a "revolutionary avatar of the mind." You be the judge (http://www.intac.com/~dmltn/dh/learywilson.html).
- Enjoy watching Bill Nye, the "Science Guy," on Saturday morning TV with your kids? We do. Nye makes science fun and comprehensible without getting too goofy. His show is a nice change of pace from muscle-bound cartoon heros (http://www.seanet.com/Vendors/billnye/nyelabs.html).

Internet renews tax battles

Murky on-line tax jurisdictions cause trouble

By Mitch Betts

Three years ago, the U.S. Supreme Court settled the issue of who should pay sales taxes in mail-order commerce. But the battle is just beginning in the world of electronic commerce.

State governments are scared they will miss out on the tax revenue that could be gleaned from on-line shopping transactions that zip in and out of their boundaries in the blink of an eye. So, they are looking to stretch old rules to apply to new technologies.

> "The traditional tax base will be eroding as electronic commerce grows."
> — *Paull Mines, Multistate Tax Commission*

"The traditional tax base will be eroding as electronic commerce grows," said Paull Mines, general counsel of the Washington-based Multistate Tax Commission, a coalition of state taxing authorities. "The key is the nexus issue: When does the state have sufficient contact with an out-of-state vendor to justify taxing them?" Mines said.

Outdated rules

The Supreme Court, in its *Quill Corp. vs. North Dakota* ruling [CW, June 1, 1992.], reaffirmed that states may impose taxes on out-of-state vendors only if the vendor has a "physical presence," such as a store or factory, in the state. That is why a nationwide catalog company such as L. L. Bean, Inc. in Freeport, Maine, levies a sales tax only on Maine customers.

The Supreme Court held its ground even though critics said the physical-presence test is outdated at a time when much of interstate commerce is conducted by mail, fax and modem.

The Multistate Tax Commission is drafting uniform state guidelines on the topic, and the latest draft maintains that on-line sales should be taxed in every state where the digital shopping service has a communications node, such as the local-access servers of on-line and Internet service providers.

But marketers oppose that approach. Robert Levering, senior vice president of the Direct Marketing Association in Washington, said the local-access server is not owned or operated by the retailer, so it does not meet the physical-presence test. The retailer only has an arm's-length contract to use the on-line service as a communications carrier, he said.

Michael H. Lippman, partner at the accounting firm KPMG Peat Marwick in Washington, agreed. "The Multistate Tax Commission didn't like the *Quill* ruling, so they're stretching the clear meaning of the words," he said.

The multistate commission's general counsel responded that it does not matter who owns the local server; the fact is that it is being used to reach consumers. Mines said the guidelines will be finished in November.

The emerging on-line services are keenly aware of the tax minefield. Michael Curry, vice president of new media for the Book-of-the-Month Club, Inc. in New York, said he has three people looking into the matter before going on-line Sept. 1. "We realize there's a sensitive issue," he said.

The issue of tax jurisdiction can get even murkier if an on-line shopping transaction is made by an airline traveler using a laptop PC connected to the seat-back data port, noted cyberspace attorney Barry Weiss, a partner at computer law firm Gordon & Glickson in Chicago.

Future malls

Cybermalls will someday make physical shopping malls as outdated as rotary phones, according to technology consultant Samuel E. Blecker, writing in the May/June 1995 issue of *The Futurist*, a magazine published by the World Future Society in Bethesda, Md. The most direct impact of cybermalls will include the following:

Lower prices for products. With the ease of comparison shopping, vendors will be hard-pressed to raise prices.

Lost tax revenue. With fewer physical malls, suburban city planners will need to find new sources of real estate and sales taxes.

A loss of jobs. Traditional summer and lower-paying jobs may disappear.

Mocha java meets cyberspace in NYC

The Internet Cafe (http://www.bigmagic.com) was Manhattan's first stop for cappuccino and cyberspace sightseers when it opened its doors on East 3rd Street on April 19. Today, New York sports at least three cybercafes, all of which offer a cozy place to hang out and plug in. There are more than 60 cybercafes worldwide, according to the Cyber Cafe Guide (http://www.easynet.co.uk/pages/cafe/ccafe.htm).

For Internet Cafe owner Arthur Perley, the space lets him combine networking know-how — gained as a systems integrator on Wall Street — with an interest in computer graphics and the arts community in the East Village.

The cafe charges $3 per hour for accessing the Web and $10 per hour for file transfer protocol, Telnet and electronic-mail access. It has several workstations on a 10Base-T Ethernet that connect to the Internet over a 56K bit/sec. line. Its 100-MHz Microsoft Corp. Windows NT server is innocuously located near the refrigerator.

— Elita Booker

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Microsoft stands tall behind The Network

By Rochelle Garner

George Meng, 30, is lead product manager of The Microsoft Network, overseeing all pricing, positioning and development issues.

This interview was conducted before the disclosure that the U.S. Department of Justice is investigating antitrust concerns about Microsoft's bundling access to The Microsoft Network into Windows 95 (CW, June 12).

Q: Why did Microsoft decide to enter the business of consumer on-line services?
A: When we examined the market, we saw a low penetration of on-line services in terms of the on-line-capable PCs. And we saw two reasons for that. First, such services are too difficult to set up and use. And second, the information they contain isn't particularly compelling. We saw the opportunity to do something fundamentally different from the rest of the on-line services. And we felt Microsoft was in the position to deliver, first, a new tool set that would permit richer content, and second, a new business model.

Q: Explain what you mean by "tools" in the context of on-line services.
A: Content providers should create their own content. Our tool set, now code-named Blackbird, is an end-to-end multimedia design system that lets people create applications with compound documents that can be delivered via The Microsoft Network.

Q: How will that content appear to the user?
A: That will be left up entirely to the content provider. We just provide the tool set that lets them deliver that content in the way they want.

Q: What do you see as the failings in today's services?
A: Currently, on-line services use a model based on connect time — of which content providers get a fraction. That's not profitable. Worse, there's no incentive to invest in creating great content for their area. In our business model, we are trying to de-emphasize connect time.

Q: Does that mean users will not be paying connect charges?
A: You'll still pay because we have to pay our network carriers. But we are trying to push down our prices to get connect time as low as is reasonable.

Q: But tell me how that new model will encourage creativity, which you say is so crucial.
A: The main thing is we are creating what is essentially a mall, with The Microsoft Network as the mall owner. To draw people in, we want to make sure we have great basic services and great special interest forums — which will be created and provided by The Microsoft Network. And then we will allow content providers the opportunity to create storefronts using Blackbird. Those providers can then charge for their services in different ways.

> "To draw people in, we want to make sure we have great basic services and great special interest forums — which will be created and provided by The Microsoft Network."
>
> *— George Meng, The Microsoft Network product manager*

Q: So how do you make your money?
A: We make our money by taking a percentage of the transactional value. It's a minority percentage that can go anywhere from 1% to 49%. . . . It depends on what the content provider is delivering.

Q: ASCII, which is an organization of independent computer retailers, will ask the Justice Department to block the plan for hardware and software vendors to support The Microsoft Network because they say it is illegal for those vendors to bypass them. [In February, Microsoft announced that 50 hardware and software vendors have signed on to the network.]
A: You have to understand this is just another channel for communicating and developing relationships with customers. You'll find a lot of these software and computer retailers are now on other on-line services, dealing directly with customers.

Q: Well let's talk about that channel. You have taken a new tack that has sent alarms throughout the journalist community. You've hired journalists to write news. Why did you do that?
A: This was a misinterpretation of our plans. We are not doing any original reporting. We are hiring people with journalism experience to package the news in a way that goes beyond a straight text dump. And we will do that by taking news feeds from the wire services, compiling them and producing them for The Microsoft Network.

Q: Where does the Internet fit into your strategy?
A: The Internet is an integral part of our overall strategy. For one, we are working with UUNET Technologies to build, on our behalf, a global TCP/IP network directly to the Internet. We've also licensed Spyglass' Mosaic browsing technology.

Q: Do you plan to enhance Mosaic?
A: Yes, but we haven't announced those details. But we will provide it to our members so they can seamlessly access both The Microsoft Network and the Internet. That means people will be able to click on what we call Shortcuts.

Q: What exactly is a Shortcut?
A: Shortcuts are OLE links to services on The Microsoft Network. I can attach them to my files, put them on my desktop and send them by E-mail. Say, for example, I've found a really cool area on The Microsoft Network — and I want you to know about it. I just create a Shortcut of this area — it's very easy, just like dragging and dropping on my desktop — and then I mail it to you. You just double-click on the Shortcut, and it would know exactly what path to take to get to there.

With Shortcuts, you can go back and forth between our network and anywhere on the Internet you can define a path to.

Q: Can people get onto the network only through Windows 95? What about Windows 3.1?
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Garner is a freelance writer in San Carlos, Calif.

Comparing data storage made easy

By Steve Moore

Users agonizing over choices among alternative data storage strategies soon will have software to help them compare those alternatives.

Interpose, Inc. in Altamonte Springs, Fla., this fall plans to announce InveStor, a network storage capacity planning and analysis tool. Systems administrators can use InveStor to evaluate different means of expanding storage capacity or reducing storage costs.

Users were cautiously optimistic about the potential benefits of storage systems analysis software. "If it gathers information automatically, it would have some added value. But if you have to supply all the information, it would have far less value," said Tom Bernhardt, a technology analyst at Star Enterprise, a Texaco, Inc. subsidiary in Houston.

Automatic generation

InveStor automatically collects storage-related information from disk drives and other devices and then generates tables and graphs that reflect network storage usage and cost trends.

The product is being used by storage systems vendors to advise users on the implementation of magnetic and optical discs and arrays, tape drives and libraries, backup systems and hierarchical storage management systems.

"We are now showing a prototype version of InveStor to get feedback on it, and we will make it into a [production] tool over the next three to four months," said Interpose President Tom Pisello. He said that users migrating away from mainframes to client/server computing seldom calculate the storage management costs associated with that migration.

"Some sort of way to visualize what is going on with storage is desirable, rather than poring through reports," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

[redacted]

Quarterdeck Corp. has introduced Quarterdeck Mosaic, an Internet browser.

According to the Santa Monica, Calif., company, Quarterdeck Mosaic assists users in exploring and gaining information on the World-Wide Web. It lets users filter the information they find and organize it into customized folders with a drag-and-drop interface.

Quarterdeck Mosaic features an automated setup program and dial-up Serial Line Internet Protocol and Point-to-Point Protocol connections to the Internet. It also includes multiple history lists, which are lists of recently visited sites; a hot-list manager where users can store favorite Web sites in customized folders; and a Link Tree navigator, which displays all hypertext links within each Web page.

Quarterdeck Mosaic costs $29.

▶ *Quarterdeck*
(310) 392-9851

Sun Microsystems, Inc. has announced it will offer upgrades for its high-end SPARCcenter 2000E servers.

According to the Mountain View, Calif., company, the SPARCcenter 2000E servers will include power and cooling upgrades, which are typically used for database and networking applications in large firms.

The SPARCcenter 2000E servers cost $125,000. The upgrade costs $18,000.

▶ *Sun Microsystems*
(415) 960-1300

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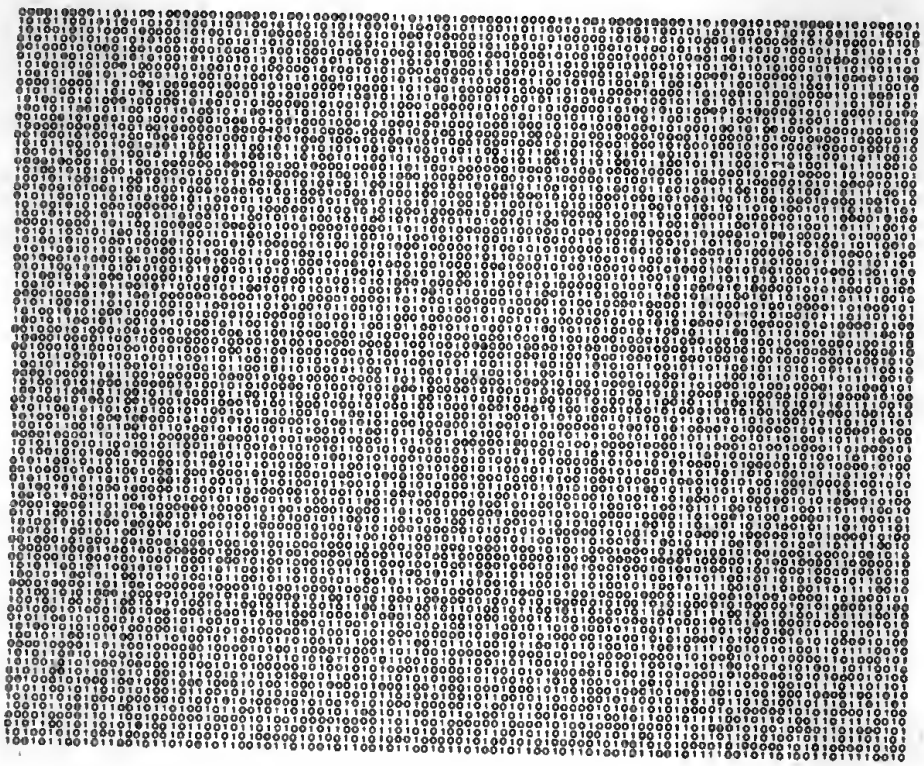

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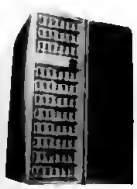

Unfortunately, there's been no practical technology to make large-scale decision support possible. Companies that have tried haven't offered much beyond some hardware and a handshake.

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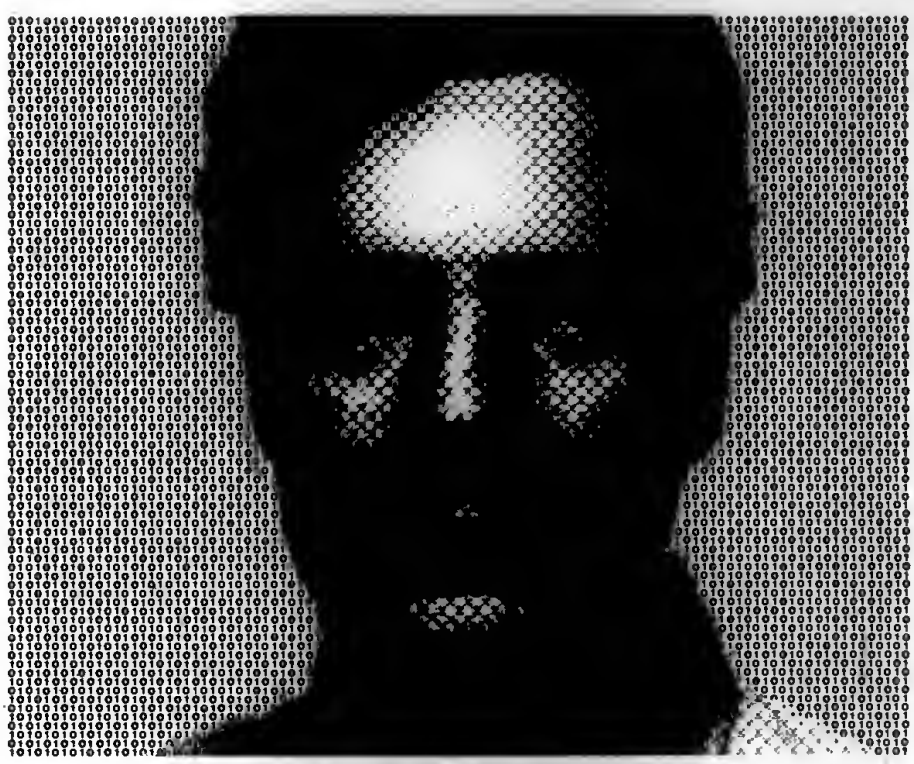

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Price drop may follow Ramac 2 array

Managers expect higher-capacity buyer's market

By Craig Stedman

Data center managers in the market for more disk capacity had some soothing news last week with the introduction of higher-capacity versions of IBM's Ramac disk array. The new arrays are also expected to prompt mainframe storage vendors to display more aggressive pricing behavior.

Executives at IBM's storage unit in San Jose, Calif., said they expect selling prices to remain in the $3-per-megabyte range after the new Ramac 2 models ship this summer. However, industry analysts forecast that prices could dip into the $2.75-per-megabyte area, a reduction of almost 10%.

Users expect to see some savings.

"It's a buyer's market out there, in my opinion," said Paul Moore, manager of data processing operations at the information systems subsidiary of Huntington Bancshares, Inc. in Columbus, Ohio.

Moore said he waited for Ramac 2 before starting in earnest to evaluate disk arrays for an upcoming purchase expected to total at least 360G bytes.

"I didn't want to make a decision based on [the original Ramac] when I knew IBM was going to be able to modify its price," Moore said. "Even if I don't choose IBM, if it gets more competitive, then hopefully the other vendors will, too."

Ramac 2 is built around 4G-byte disk drives, which have twice the capacity of the drives used in the first models introduced last year. IBM can now pack 180G bytes of usable capacity into a single array rather than require two subsystems to reach that level. And that should translate into lower costs, Moore noted.

"I would suspect that we're going to see a definite price differential" between the first Ramac models and Ramac 2, said Michael Puldy, manager of resource management at Barnett Technologies, Inc., the IS unit of Barnett Banks, Inc. in Jacksonville, Fla.

Barnett has 360G bytes of Ramac in place, out of a total capacity of 2.5T bytes, and it is likely to buy some Ramac 2 arrays late this year, Puldy said. The new models also require less floor space, but the promise of savings is the key, he added.

"When we go to [the bank's] financial guys to justify a purchase, they don't care about the floor space," Puldy said. "They want to see what the price is."

Seconds, anyone?

The second generation of IBM's Ramac disk arrays includes the following features:

- Disk drive capacity: 4G bytes
- Mean time between failures: 1 million hours per drive
- Operating mode: RAID Level 5 only
- Maximum array capacity: 256G bytes
- Maximum usable capacity: 180G bytes
- Cache memory: 64M to 2G bytes
- Shipment date: Late August
- List price: $1,135,000*

*Maximum disk configuration with 256M bytes of cache and four Escon channels. Requires 3990 Model 6 storage controller.

Dead heat

The potential for lower pricing should help IBM give rival EMC Corp. "a semi-run for its money" in its fight for the 1995 mainframe disk shipment lead, said Carl Greiner, an analyst at Meta Group, Inc. in Stamford, Conn. However, Greiner noted that EMC's flexible support for multiple RAID levels and data formats is still an advantage.

Nonetheless, Robert Callery, an analyst at International Data Corp. in Framingham, Mass., said Ramac has been a plus for IBM, which claims to have shipped 4,500 of the arrays with about 350G bytes of capacity since releasing them last fall. This year's shipment contest, once almost ceded to EMC, now appears to be more of a toss-up, Callery added.

As expected, Ramac 2 faces two potential roadblocks with users. IBM earlier this year dropped plans to double the 180G-byte ceiling on the amount of capacity supported by its 3990 Model 6 controller. IBM executives confirmed last week that the computer giant does not expect to support the Ramac devices on a new controller due out during 1996.

However, Moore said those issues will not be major drawbacks for Huntington Bancshares "as long as IBM has the right price" for Ramac 2. Beyond pricing, the change of plans on the 3990 would be cause for alarm only if the bank were squeezed for floor space, he added.

IBM reiterated that it will essentially package two controllers for the price of one to make up for its decision to keep the 180G-byte limit on the 3990.

To ease concerns about its plan not to support Ramac on its future Seastar controller, IBM will allow customers who lease Ramac 2 arrays through IBM Credit Corp. to trade up to Seastar and a companion disk subsystem without changing the terms of their leases.

Oracle launches troubleshooting plan with a little help from friends

By Steve Moore and Kim S. Nash

Oracle Corp. recently unveiled plans for a series of systems management products — some homemade, others available through third parties — intended to give users monitoring and troubleshooting tools.

Yet some of the most advanced pieces, such as utilities for taking care of specialized parallel or warehouse Oracle databases, are not due for more than a year. Meanwhile, Oracle must prepare for a fight against Microsoft Corp. and its forthcoming database and systems management software, observers said.

"Oracle is trying to build a fence to keep Microsoft from encroaching on them," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. He added that if Oracle fails to roll out its new software before Microsoft's Systems Management Server (SMS) takes hold in the client/server system management market, "they won't be able to sell it, at least on Microsoft platforms."

SMS began shipping last November, and a major new release is slated for the end of this year. Meanwhile, Redwood Shores, Calif.-based Oracle has staggered shipping dates for the various parts of its management product line (see chart).

Cooperative effort

Oracle's plans come as many large user sites look to integrate database management tasks with current systems management frameworks, such as Sun Microsystems, Inc.'s Solstice.

Users point out that such cooperation is a must because neither tool set can do it all. For example, while today's database management tools can show who is using a database, the products "can't see whose database threads are bogging down the system," said Glenn Travis, a database administrator at Circuit City Stores, Inc., an electronics retailer in Richmond, Va.

Oracle aims to meet user needs with a multifaceted approach.

First, the vendor plans to ship next month a new version of its Oracle7 Workgroup Server database that will include a set of management aids dubbed Battlestar, said John Morrell, director of product marketing at Oracle's distributed solutions group.

Second, Oracle has signed up a few dozen third-party management tools companies to support the Oracle7 database. Also, work is under way at Oracle, Sun and Hewlett-Packard Co. to make the Oracle7 database a repository for Sun's Solstice and HP's OpenView management platforms, Morrell said.

Next, while Oracle's own tools may suffice for small and midsize user sites, the company said it will refer customers "with thousands of systems and databases" to products from Tivoli Systems, Inc. in Austin, Texas.

Oracle is not alone. Rival Informix Software, Inc. has signed Tivoli on to support its OnLine database, while Sybase, Inc. relies on Tivoli for much of its systems and database management strategy.

However, problems running and managing several databases on one machine appear to be here for the long haul: None of the upcoming management offerings from Sybase, Oracle and others will minister to other vendors' databases. Some will not even acknowledge that another database is nearby. And that does not make a database administrator's day, Travis noted.

"We have machines that have Oracle, Ingres and Sybase all on the same box, and who do you point the finger to there?" he asked.

Managing expectations

Oracle plans to release a series of systems management products in the next 12 to 18 months

Summer 1995

Battlestar, a set of aids for monitoring and fixing workgroup-level Oracle databases

Late 1995/early 1996

Mission Control, a more capable set of tools – including advanced performance tuning and replication managers – for enterprise-level systems

Fall 1996

Applications for managing specialized Oracle systems, such as Very Large Databases and Oracle Parallel Server

Rebounding Sequoia grows strong

By Michael Goldberg

More than two years ago, Jim Young, MIS vice president at C. L. Frates and Co., was brainstorming with other users of Sequoia Systems, Inc.'s fault-tolerant computers about what to do if their cash-broke vendor went bust.

Now that the Marlboro, Mass.-based Sequoia has recovered from its financial woes and, more recently, is showing signs of growth, Young said he feels his Oklahoma City insurance firm has been rewarded for its loyalty.

Young is not alone. Other customers said they are glad they stuck it out with Sequoia. The company, they said, has good technology — even if it has had its ups and downs over the years.

The company now appears to be on a growth track. In March, Sequoia completed a merger with Texas Microsystems, a Houston-based maker of PCs that can withstand harsh working conditions. The deal doubled Sequoia's size to $90 million in sales.

Peter Masucci, Sequoia's marketing vice president, said the merger lets the company reach more industrial users and a growing telecommunications field.

Jim Kennedy, author of "The Kennedy Letter" in Hunt Valley, Md., said the company's earlier financial problems have cast a shadow over Sequoia's market reputation that does not credit its performance. The merger with Texas Microsystems should help Sequoia grow, he said.

Customers seem to agree. In October, Miami-based Associated Grocers of Florida, Inc. spent about $200,000 on a two-processor Sequoia Series 40 system to track 24-hour orders and inventory for 400 wholesale customers. MIS vice president Luis Barroso said he picked Sequoia because of its compatibility with a Pick Systems' database.

Young, the new Sequoia users group president, said C. L. Frates bought a two-processor Series 200 in 1989 for 32 users to handle insurance claims around the clock. It has since upgraded to a system that serves 128 users with 4.3G bytes of disk space. "We felt their problems were not a result of the products they have," he said.

Tough challenges

Despite this and other customer backing, "they certainly have a lot of challenges ahead of them in such a competitive marketplace," said Jim Johnson, president of The Standish Group International, Inc. in Dennis, Mass.

Sequoia officials acknowledged that the firm is a "distant 3rd" in the number of fault-tolerant systems sold, behind rivals Tandem Computers, Inc. in Cupertino, Calif., and Stratus Computer, Inc. in Marlboro, Mass.

And Sequoia's dependence on Motorola, Inc. 68040 processors leaves it vulnerable to vendors using faster chips, Johnson added.

Sequoia officials said the company and two licensees, Toshiba Corp. in Japan and Samsung Electronics in South Korea, are working on systems that use faster chips made by Intel Corp. and the PowerPC alliance of IBM and Motorola. Sequoia's Intel-processor system is due within a year.

This is the kind of approach that long-time users want to see, said Richard Sueltenfuss, MIS director at Potpourri Collections, Inc., a $30 million mail-order catalog business in Medfield, Mass.

"I don't want to see them standing still. In our business, where almost 60% of our orders come in over the telephone, the worst thing we can say is, 'I'm sorry, we can't help you. Our computer system is down,'" Sueltenfuss said.

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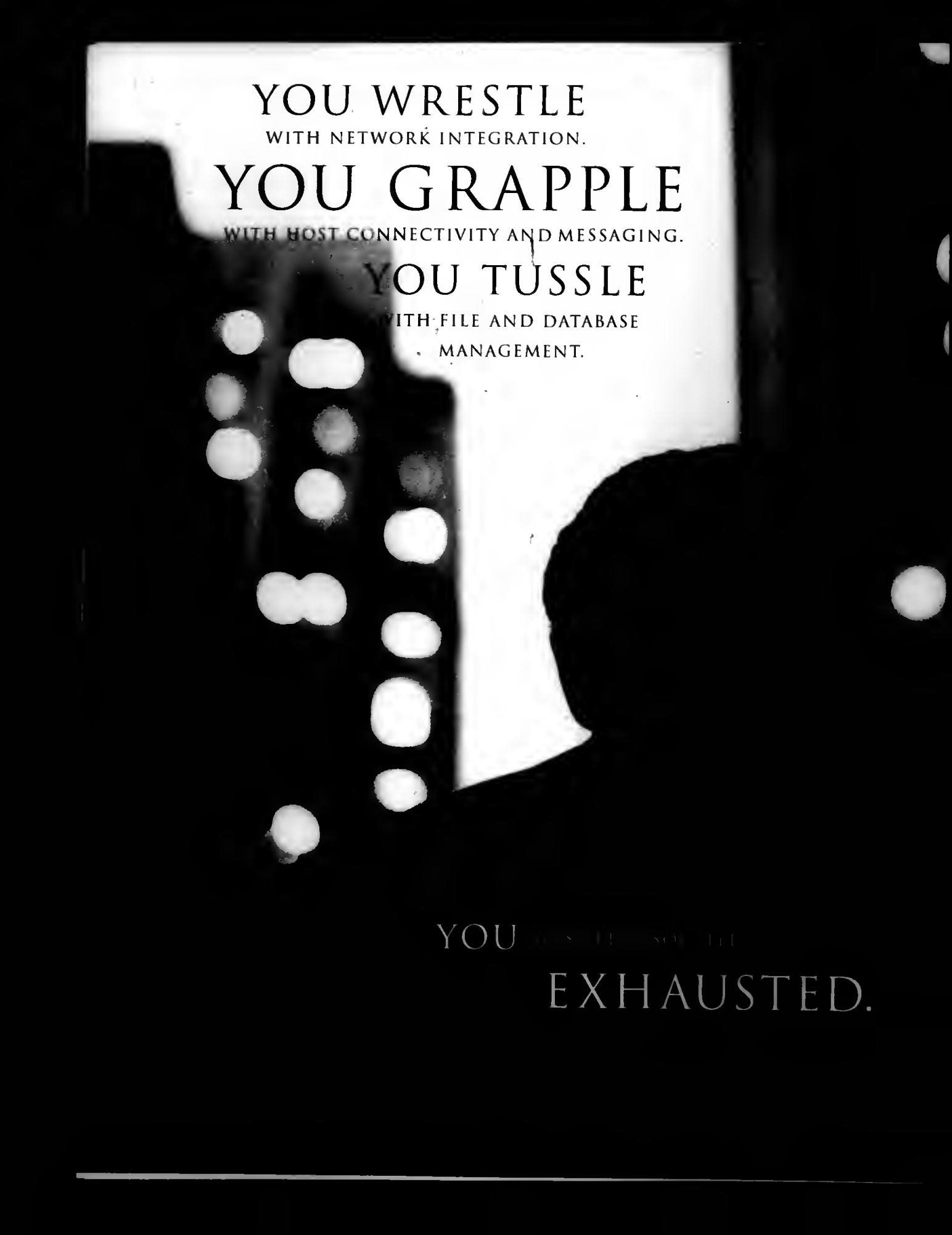
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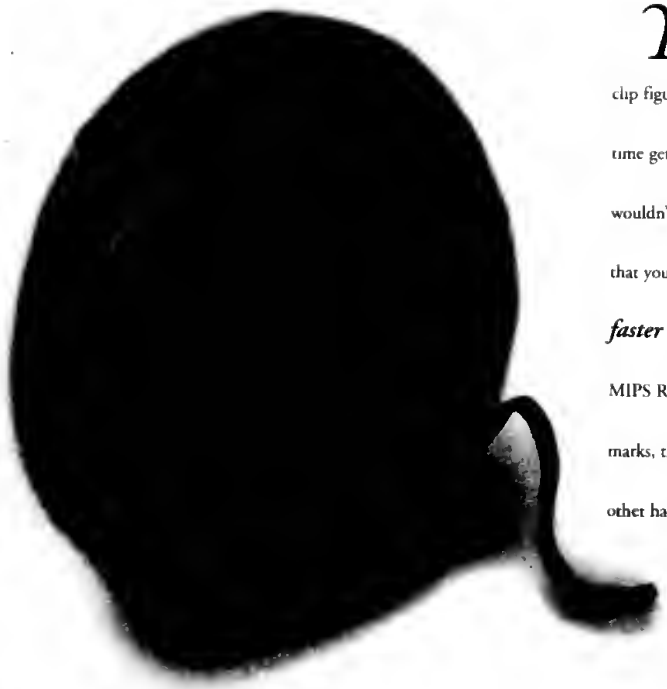

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*Compared to a Pentium™-processor-based system

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CA/Legent union tangles licensing pacts

By Thomas Hoffman
SAN JOSE, CALIF.

If the sale of Legent Corp. to Computer Associates International, Inc. passes through all the necessary legal hoops, CA will be legally bound to honor existing Legent customer pacts, according to Karen Cone, research director of information technology management at Gartner Group, Inc. in Stamford, Conn.

Nevertheless, Legent licensing issues were among the hottest topics discussed by the 300-plus attendees at a Gartner Group conference on asset management held here recently. The concerns expressed by Legent licensees only helped highlight how much confusion there is among Legent customers these days.

Most Legent mainframe software shops have bought into perpetual license agreements, which entitle customers to run the Herndon, Va.-based vendor's software for a set fee with no time restrictions. Still, CA is expected to make a concerted effort to lure these shops into one of its maintenance savings plans, according to Cone.

It is not clear which option would better serve users. Depending on their technical needs and budgets, some customers may land better deals working with CA, while others would do best to stick to their perpetual licenses under their Legent contracts, Cone said.

Legent's perpetual license customers do not have to ante up on software licensing costs on a monthly or annual basis as do CA's renewable licensees. But they may reduce their software maintenance costs by latching on to one of CA's plans, according to Gartner analysts.

Waiting for savings

Once a Legent shop signs up for a CA maintenance plan, it would be forced to relinquish its perpetual licensing privileges and be ushered into a CA renewable software pact — most of which run five or 10 years.

Under CA's renewable licenses, the cost savings in a five-year license typically do not show up until the third or fourth year of the contract, according to Andrew Dailey, a senior research analyst at Gartner Group's information technology management unit. "That's typically when CA jumps in to rework the deal and push [the cost savings] off another five years," Dailey said.

"We traditionally honor all existing contracts," said a CA spokesman, who declined to comment further on the Legent licensing issues.

But Cone said some Legeat customers may benefit by working with CA on new maintenance plans.

Dominick T. Scafidi, director of corporate information systems services at Niagara Mohawk Power Corp. in Syracuse, N.Y., said he has not yet figured out what impact a CA takeover will have on the utility's perpetual Legent licenses. But he said he hopes that this time around CA will prove a more flexible bargaining partner than it was in 1992, when Niagara Mohawk haggled with CA over an enterprise software licensing agreement.

"When CA rolled out their enterprise licensing deals [in 1992], they essentially threw it on the table for us and said, 'Here it is — take it,'" Scafidi said. "It was basically extortion." CA declined to comment.

Scafidi, like other conference attendees, said CA has become a more flexible company to work with since then. "They had to change — they were losing too many customers," Scafidi added.

James J. Schindlbeck, manager of support services at United Technologies Automotive (UTA) in Dearborn, Mich., said his firm is insulated from any effect CA's Legent takeover may have on UTA's Legent licenses.

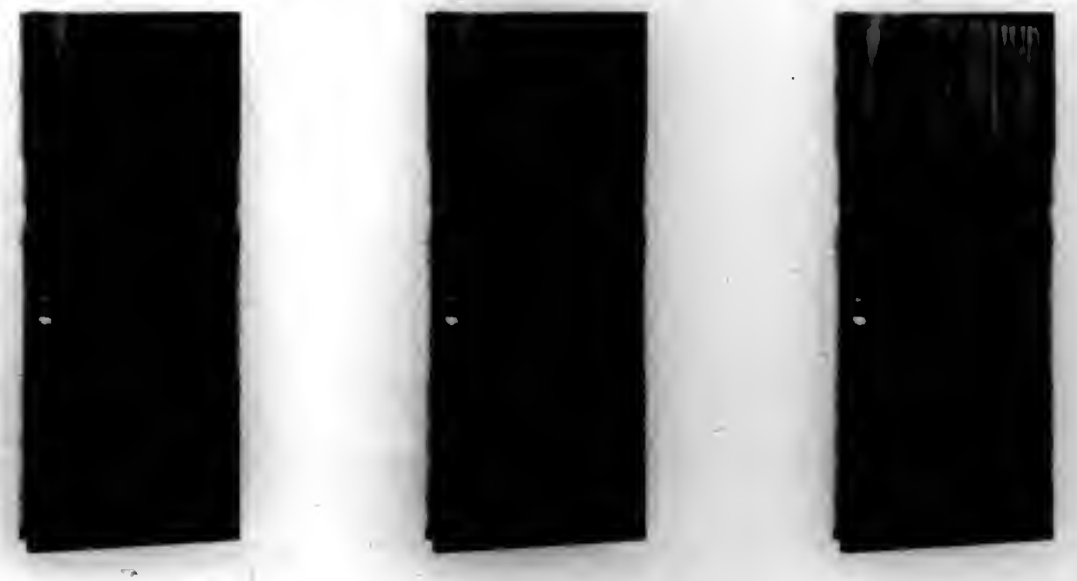
Under the five-year mainframe outsourcing deal UTA signed with The Geaix Group in 1993, the automotive services provider canaot incur any software price increases — only decreases, Schindlbeck said.

A tale of two licenses

Under Legent's perpetual software licenses, users pay a one-time fee to use the software forever. However, maintenance is not included. Users can either pay separately for maintenance or maintain the software themselves.

With CA's renewable licenses, users pay for the right to use the company's software for a specific amount of time, usually in five-year increments. As with Legent's perpetual licenses, software maintenance is handled separately.

Source: Gartner Group, Inc., Stamford, Conn.



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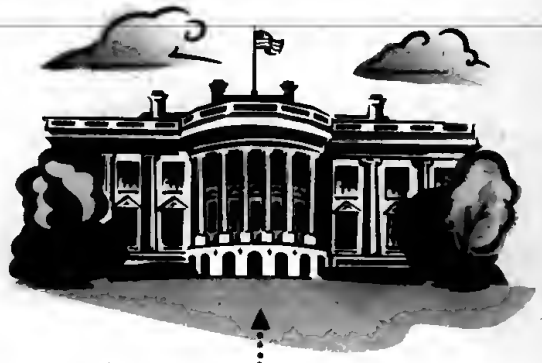

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Mexican bank finds crisis control

Timely technology investment helps track past-due loans

By Thomas Hoffman

Triple-digit inflation and double-digit interest rates have sent Mexico's economy into a tizzy since November. While consumers and businesses are bearing the brunt of the nation's currency crisis, Mexican banks have also found themselves saddled with mounting loan obligations.

One bank, Serfin Financial Group in Mexico City, has taken what analysts say is a leading-edge technological approach to tracking its past-due customer loans. Serfin is the holding company for the nation's third-largest bank, with $2 billion in assets and 800 branches.

Serfin recently rolled out a client/server-based executive information system (EIS) and data warehouse to enable its top officers to review outstanding customer loans daily on a branch-by-branch basis.

"Mexican enterprises have found it difficult to pay their loans" due to spiraling interest rates, said Salvador Cardona, deputy director of market information at Serfin. The use of a graphical EIS system "helps our executives to keep track of those outstanding loans" by enabling them to monitor the daily growth of their liabilities, he explained.

Serfin's Salvador Cardona: *Graphical EIS enables daily monitoring of liabilities*

Left out

Serfin began developing the EIS system, using SAS Institute, Inc.'s SAS/EIS software last year, but not in anticipation of a Mexican currency crisis. After years of government regulation, the Mexican banking industry was privatized in 1991, and many banks, including Serfin, found themselves behind the technology curve. In 1994, Serfin began ramping up its technology assets to deliver information to its decision-makers.

Prior to the EIS project, Serfin's officers could look at daily customer data only by using Informix Software, Inc.'s Wingz graphical spreadsheet software. The EIS system Serfin developed with SAS was designed so that users can view a month's worth of data. That enables bank executives to perform budgeting and forecasting activities.

Cardona declined to specify Serfin's investment in the EIS and data warehousing technologies.

SAS/EIS extracts, loads and summarizes customer data into a Sybase, Inc. database. The software runs on a Hewlett-Packard Co. HP 9000-G30 Unix server as well as on Intel Corp. 486-based client workstations used by Serfin's 12 top corporate officers. The officers are connected to the Sybase data warehouse via TCP/IP links, according to Lilian Amador, an application development manager at SAS Institute S.A. de C.V. in Mexico City, who helped Serfin build the EIS system.

Step up

Serfin is upgrading from a Sybase 9 to a Sybase 10 relational database management system and from a Hewlett-Packard HP 9000-G30 server to a HP 9000-T500 machine to increase its disk storage capacity during the next three months.

Collecting data

One of the most challenging design aspects, Cardona said, was the development of the Sybase data warehouse. The bank initially had a tough time culling data from disparate operating systems at its three primary data centers in Mexico City, Guadalajara and Monterrey. Although the EIS development took only one month, the development of the data warehouse took the bank six months, he noted.

Despite the data warehousing learning curve, Serfin has made deep inroads with the technology. For example, the new EIS/data warehousing system has decreased Serfin's response time to perform a forecast from two hours to 30 seconds.

EIS "is a very exciting piece of software that I've seen at a number of banks — including Chase [Manhattan] and American Express — but this is a first for a Mexican bank," said Raphael Benabou, a former Nolan, Norton & Co. consultant who now has an independent practice in Manhasset, N.Y.

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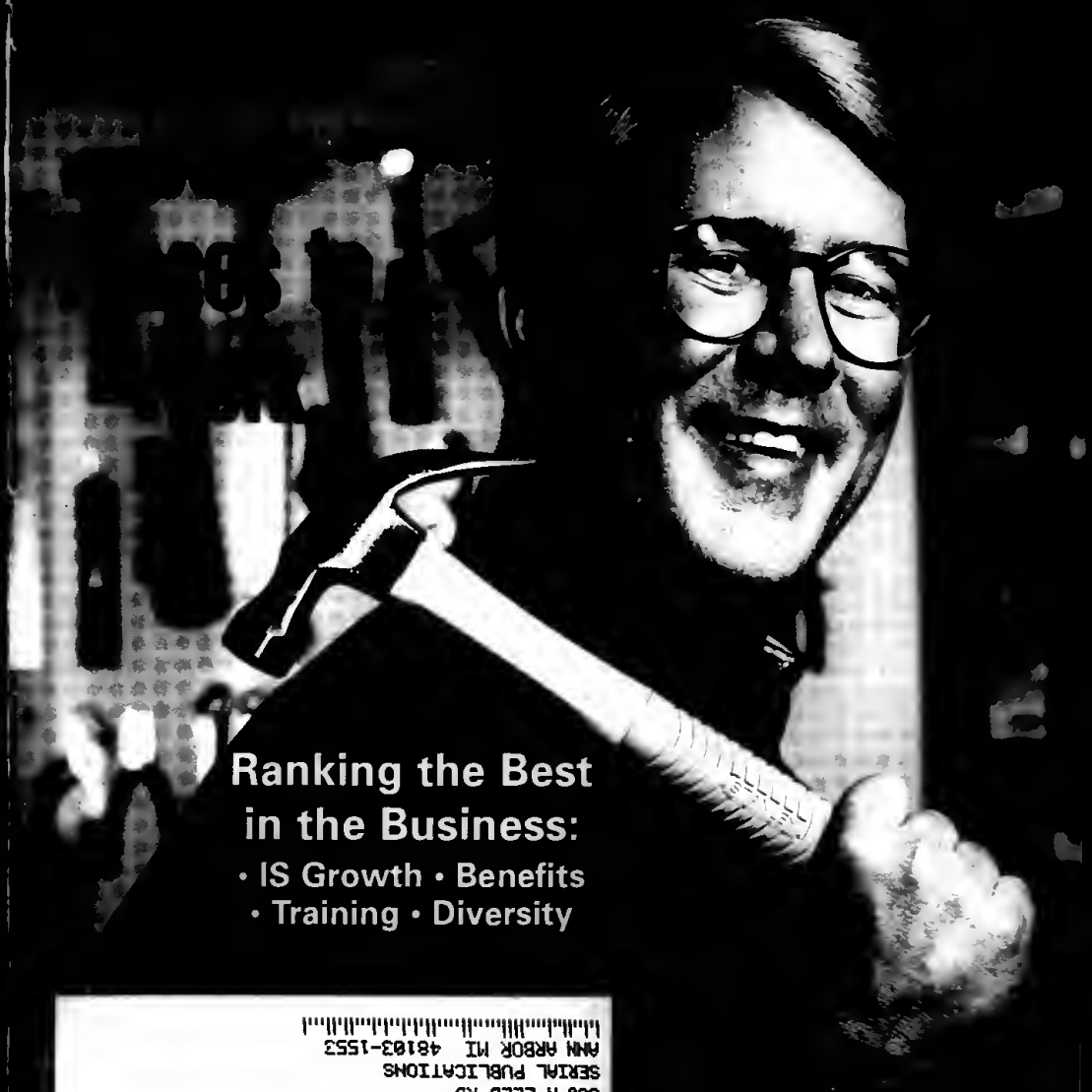

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The 100 Best Places to Work

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• EDITOR'S NOTE •

Excercising with The Best

THIS YEAR'S BEST PLACES to Work issue reveals some important trends for companies to watch as they plan IT staffing. For one thing, strong demand for qualified IT professionals is creating cutthroat competition and producing a sellers' market. The result: company loyalty is out the window. What's more, demand for benefits is changing, and the need for training is at an all time high.

Every company has its own approach to dealing with these and other issues. Corporate culture and tradition play a role as do industry sector and location. But for all managers, benchmarking against The Best is a healthy exercise.

It's healthy because you need to baseline your own performance. Without a baseline, you cannot measure improvement. And without improvement, you will surely lose your best IT professionals to the competition.

So turn the page to find out how The Best stay fit. See how you compare in terms of compensation, raises, staff growth, divetsity and a host of other issues that are important to your IT staff.

Here's to your good health.

Bruce Rayner, *Editor*

The Best Places team (left to right) Joyce Chutchian Ferranti, Amy Malloy, Bruce Rayner, Nancy Kowal and Bob Fink

PHOTOGRAPHY BY RICK FRIEDMAN

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The BEST **attract** *The* BRIGHTEST

By Bruce Rayner

Every company is looking for the right formula for attracting and keeping the best and brightest information systems professionals. This is a vital concern, because, for many companies, IS has become the source of competitive advantage.

In the second annual ranking of the 100 Best Places to Work, *Computerworld* surveyed top-shelf organizations to find out how they create the right environment. The results were gleaned from information provided by the IS professionals who work at the 100 Best Places to Work companies on such fundamentals as salary levels and growth, benefits, IS staff growth, training, racial and gender diversity, organizational communications and the use of advanced technologies. (For complete company details, see tables beginning on page 70.)

From 30,000 feet, the solution appears simple: IS employees want the best possible growth opportunities, benefits and training, the highest salaries and access to cutting-edge technology. Closer to ground zero, however, the formula becomes more complex and differs from company to company.

Of course, certain benefits are basic, such as some type of health care coverage. On average, 85% of the Top 100 companies on the list pay health care costs for over half of their employees.

Keeping IS employees happy and motivated is a balancing act between affordability and employee expectations.

ILLUSTRATION BY JOHN BLECK

And more than 90% of these companies offer their IS employees flexible work hours as well as fitness and wellness programs.

Other benefits have gone by the wayside. A case in point is the company-sponsored pension plan. Seventy-one percent of the 100 Best Places to Work organizations contribute less than 10% of their employee's annual salary to some sort of a retirement plan.

With re-engineering and downsizing still in full swing, fewer companies can afford above-average salaries and liberal benefits packages. And the notion of offering job security and long-term growth prospects is increasingly unrealistic; in the minds of many professionals, longevity is counted in years, not decades.

Instead, companies must balance the cost of enticing top-notch IS professionals with available budgets, all the

THE 100 BEST PLACES

The following is a list of the 100 Best Places to Work organizations by industry

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Avon Products, Inc
Colgate-Palmolive Co
The Gillette Co
Helene Curtis Industries Inc
Jostens Inc
Levi Strauss & Co
Maytag Corp
Nike Inc
Phillips-Van Heusen Corp
VF Corp

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Occidental Petroleum Corp
Quantum Chemical Corp.
Rohm and Haas Co
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Informix Software, Inc
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Xerox Corp.

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Price Waterhouse
Suntrust Service Corp

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Campbell Soup Co
Pepsico, Inc
Standard Commercial Corp

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Corning, Inc
International Paper Co
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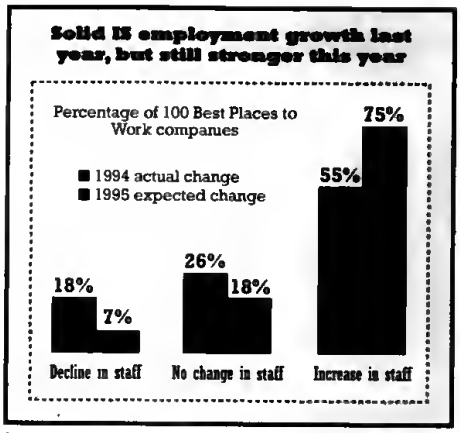
Being a top-ranked place to work takes a good dose of progressive management and sound financial performance. Many of the Best Places to Work organizations are on the list precisely because they are successful innovators, both in their core business and in their use of technology.

Take, for instance, The Home Depot Inc., this year's top-ranked Best Place to Work. With sales growth in 1994 hitting 36%, Home Depot's IS department grew 15%, and IS salaries rose by 7%. The same staffing growth rates are expected this year, according to Ron Griffin, CIO and vice president of IS. The IS department is currently made up of about 50% women and 20% minorities.

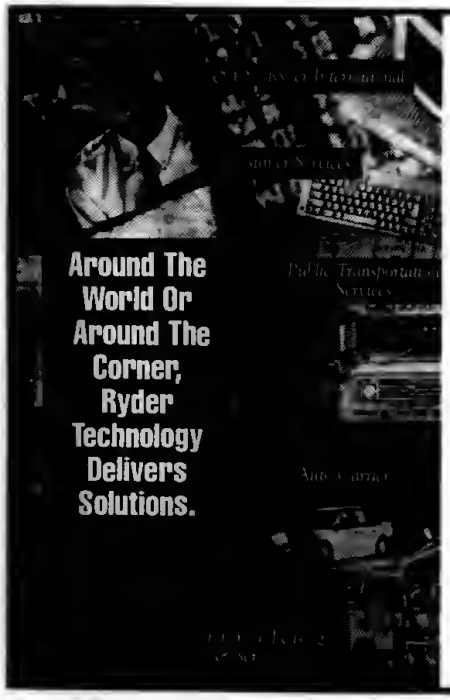
While Home Depot outperformed the averages for the Top 100 Best Places to Work companies in all major categories, there are some exciting IS trends overall. Average IS employment growth in 1994 for the Top 100 was 4% and average salary growth was 5%; projections for this year are 7% and 5%, respectively. Training budgets average 10 days per year at the top 100 companies. On average, minorities at the Top 100 Best Places account for 17% of the IS work force and women account for 39%.

In a few cases, diversity is an institutional commitment. Reader's Digest Association, Inc. has one of the most diverse workplaces on this year's list. More than 40% of the Pleasantville, N.Y.-based publisher's IS employees are women and minorities, the company reports. Other companies also find

Solid IS employment growth last year, but still stronger this year



Source *Computerworld* Survey of the 100 Best Places To Work companies



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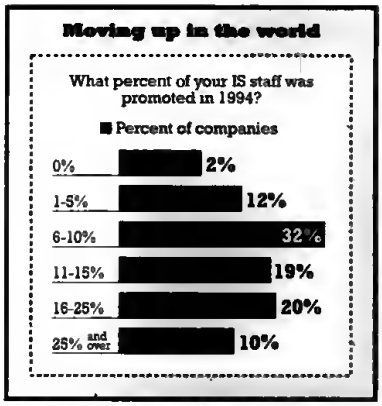
that diversity pays: Suntrust Service Corp., Merrill Lynch & Co., 3Com Corp., Pacific Bell and AT&T Consumer Communications Services all share an above-average commitment to a diverse workplace.

Back to basics

Surveying the Top 100 companies, it's clear the magnets for attracting and motivating the best IS professionals are, first and foremost, a commitment to cutting-edge technology coupled with a commitment to training. It's pretty basic: If the job isn't challenging and resources are not available for education, good IS people will leave.

The paradox is that they may leave anyway. Even with challenging work, job hopping has become a way of life in the '90s. Employers that recognize this and invest in skills development are ahead of the game, while companies that base their training investments on a long-term payback might only be asking for trouble. Today, training is a condition for keeping up, not for getting ahead. (See "Benefits: How Much is Enough?", page 58.)

It's not possible to underestimate the importance of training. Nine of the 100 companies on the list offer more than 20 days of training per year; only three of the companies on the list offer fewer than four days per year. Top trainers include Campbell Soup Co., Computer Associates International, Inc., the U.S. Arms Control and Disarmament Agency, Polaroid Corp. and Entergy Corp. (See "An Ounce of Training," page 51.)



Source: *Computerworld* Survey of the 100 Best Places To Work companies

Watch me grow

Just as important for many IS professionals is to work in a company on the move. For the Top 100 companies, growth and training are almost synonymous.

According to *Computerworld's* survey, three-quarters of the 100 Best Places to Work companies say they are planning to add IS staff in the coming year, and a full 30% expect staff in-

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Today, Vanguard's long range Information Technology plan, the IT Voyage,* which calls for additional business reengineering and increased integration of automation, is entering its next leg. Charged with not only supporting our success, but driving it, we seek to enhance our leadership position both by investing in new technology, and in locating and employing those IT professionals who can play an integral role in sustaining the momentum we've created.

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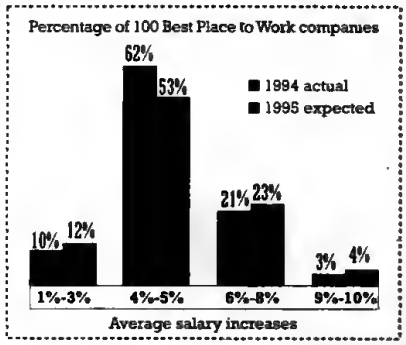
creases in excess of 10%.

At the top of the staff growth list this year was second-ranked Computer Associates, which added 1,684 new IS employees in 1994. Sears Roebuck & Co. had the second highest growth rate in 1994, adding 1,000 new IS employees to the payroll. In 1995, CA plans to add another 20% to its IS department and Sears says it will add 15%. (See "Growth Ptospects," page 16.)

Close behind these two high-growth companies is New York-based consultancy Price Waterhouse, which added 800 new IS professionals to its payroll in 1994, representing a hefty 40% increase in its IS work force. The company expects to grow its staff an additional 20% this yeat. Price Waterhouse is not alone: Last year, a number of consultancies saw staff growth in excess of 30% with similar growth rates expected this year.

While Price Waterhouse was the only Big Six accounting and consulting firm on this year's Best Places to Work list, the IS consulting field in general is going like gangbusters, outpacing most industries in its pursuit of new employees and often enticing them away with the promise of higher pay and more interesting, varied assignments (See "Consultancies: On a Hiring Binge," page 23.)

Raises hold steady: How the Best reward their IS departments



Source: *Computerworld* Survey of the 100 Best Places To Work companies

Double-digit plans

In addition to consulting, three other fast-growth segments are on the list: computer hardware, softwate and office equipment; pharmaceuticals and health care; and wholesale and retail. All three segments posted double-digit increases in IS staff in 1994 and have double-digit plans for 1995. In addition, they all posted

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when you think IBM Research First, there's the technology It's definitely hot. The mandate is 'pull out all the stops' and deliver breakthroughs that will define the future - the world's as well as IBM's We operate the most advanced and best equipped research facilities in the world.

Now let's talk performance. Definitely hot. Five scientists on our staff have won the Nobel Prize - plus there's no doubt we've been responsible for some pretty impressive advances in information technology Our accomplishments include the Butterfly computer, the ThinkPad and other mobile computing technologies; optical networks, infrared connectivity and other leading edge networking applications and advances in science, semiconductor technology, storage, hardware and software.

Now let's talk opportunities. Again, definitely hot. We're interested in talking to experienced professionals - and recent Bachelor's, Masters, and PhD level graduates (or the equivalent). Development projects are underway in some very 'hot' areas including interactive graphics and virtual reality, intelligent agents, video (MPEG/TV), ATM networks, optical networks, speech recognition - to name just a few.

Now let's talk environment. 'Hot' when it comes to intensity of commitment, yes But also 'cool' - for how else would you describe flexibility and an openness to new ways of doing things.

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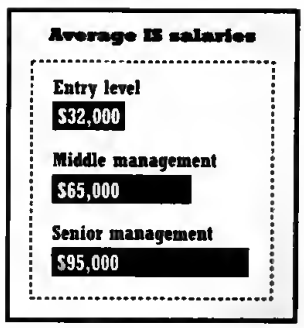
healthy promotions, with between 14% and 17% of their IS staff receiving promotions.

Who are these companies hiring? Over the last five years, on average, the Best Places to Work companies have hired 20% of their IS employees at the entry level, 28% with 1 to 3 years of experience, 40% with 4 to 10 years of experience and 12% with more than 10 years of experience.

Mapping growth

Looking at growth on a regional basis, 1994 saw the highest IS employment growth (6.2%) in the western states, primarily in California. Not surprisingly, topping the list of Best Places to Work are technology companies: Cisco Systems, Inc., National Semiconductor Corp., Informix Sofrware, Inc. and 3Com., all headquarrered in the San Jose/San Francisco Bay area. (See regional map, page 13.)

The West is not only a high growth region, but companies also, on average, rewatd their IS people well. The national average for salary increases in 1994 among the 100 Best Places to Work companies was 5%. The western states posted a 5.3% average. Four companies in the region, Apple Computer, Inc., Cisco Systems, Informix Software and Hewlerr-Packard Co. posted salary increases of 7%.



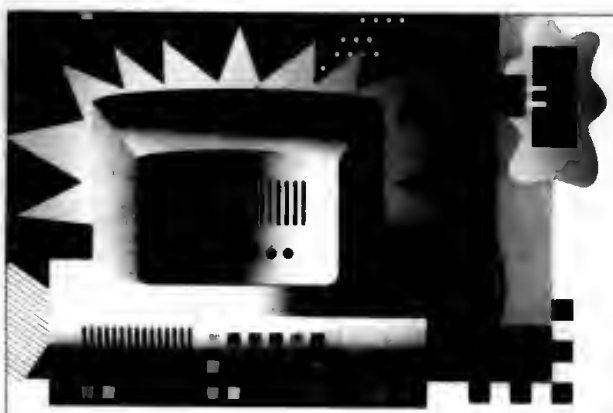
Source *Computerworld* Survey of the 100 Best Places To Work companies

And it's a repeat performance in 1995. Salary increases at the national level for the 100 top companies are projected to hold steady at 5%, bur the western srates raises will jump slightly to a rate of 5.4%.

A shift is taking place, however. Regional projections point to the southern states as having the best IS growth prospecrs in 1995. In 1994, the 26 companies that make up the southern states Best Places to Work contingent— stretching south from Washington DC to Florida and west to Texas — expect to see IS employment growth topping 8.2% this year, up ftom 5.6% last year. A close second is the western states, which expect growth of 8%.

Seven companies in the South expect IS staff growth of 15%. One, Trinity Industries Inc., expects 20% growth. ♦

BRUCE RAYNER IS COMPUTERWORLD'S EDITOR OF SPECIAL PROJECTS.



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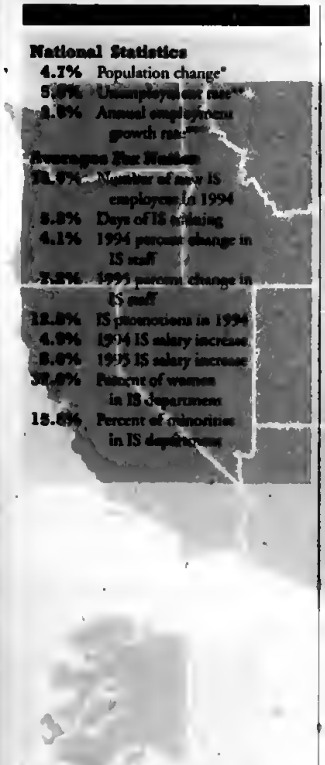

National Statistics

4.7% Population change*
5.6% Unemployment rate**
2.8% Annual employment growth rate***

Averages For Workers

28.9% Number of new IS employees in 1994
5.8% Days of IS training
4.1% 1994 percent change in IS staff
2.2% 1995 percent change in IS staff
12.8% IS promotions in 1994
4.9% 1994 IS salary increase
5.0% 1995 IS salary increase
38.6% Percent of women in IS departments
15.6% Percent of minorities in IS departments

*Population Change from 1990 to 1994. **Unemployment Rate 1995 projection. ***Annual Employment Growth Rate 1995 projection. Sources: Regional Financial Associates, Inc. West Chester, Pa. Bureau of the Census, Washington DC

States
Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin

Top 5 Best Places to Work
1. Key Services Corp.
2. Parker Hannifin Corp.
3. United HealthCare Corp.
4. First Chicago Corp.
5. Mayflower Transit Co.

Regional Statistics
2.9% Population change*
4.6% Unemployment rate**
2.2% Annual Employment growth rate***

An Average of **10.5** days of formal IS training are offered by the Best Places to Work companies in the Midwest.

Company Highlight
Key Services Corp. has an IS staff with about **50%** women.

States
Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

Top 5 Best Places to Work
1. Computer Associates International, Inc.
2. VF Corp.
3. Xerox Corp.
4. Reader's Digest Association, Inc.
5. Merrill Lynch & Co.

Regional Statistics
1.2% Population change*
5.9% Unemployment rate**
1.5% Annual employment growth rate***

There are an average of **145.5** new IS employees hired per Best Places to Work companies in the Northeast.

Company Highlight
Computer Associates hired **1,684** new IS employees in 1994, the highest number of any company.

States
Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

Top 5 Best Places to Work
1. Cisco Systems, Inc.
2. National Semiconductor
3. Informix Software, Inc.
4. 3Com Corp.
5. Levi Strauss & Co.

Regional Statistics
7.7% Population change*
5.6% Unemployment rate**
2.4% Annual employment growth rate***

There is an average predicted increase in IS staff of **6%** over the next year in the Best Places to Work companies in the West.

Company Highlight
The highest in the region, **20% plus** of Cisco Systems' IS staff was promoted last year. The company predicts the same for this year.

States
Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia

Top 5 Best Places to Work
1. The Home Depot, Inc.
2. Suntrust Service Corp.
3. Entergy Corp.
4. James River Corp.
5. Barnett Banks, Inc.

Regional Statistics
5.1% Population change*
5.5% Unemployment rate**
2.8% Annual employment growth rate***

An average of **13.5%** of IS employees were promoted last year in the South's Best Places to Work companies.

Company Highlight
Entergy provided employees with **20+** days of formal IS training.

Map information compiled by Amy Malloy. Illustration by Dixon Rohr
Source: Computerworld 100 Best Places to Work Survey

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Information Technology Consultants

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- Object-Oriented Development
- [illegible], SmallTalk, Sybase, C, C++, or SQL Server
- Oracle DBA (UNIX environment)

Business Process Re-Engineering Consultants

- Business Strategy Formulation
- Business Process Planning
- Data Modeling
- Change Management

[illegible]/Team Leaders

- Full Life Cycle Development
- Client/Server

[illegible]

- Thorough Understanding of FileNet Architecture
- WAL Programming Experience (Windows or UNIX)

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- Logical and Physical Database Design
- UNIX System Administration
- VAX/VMS

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Lisa Marx, Senior Vice President.

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Manufacturing Consultants

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Windows NT Systems Developers

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UNIX Systems Developers

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Strategist

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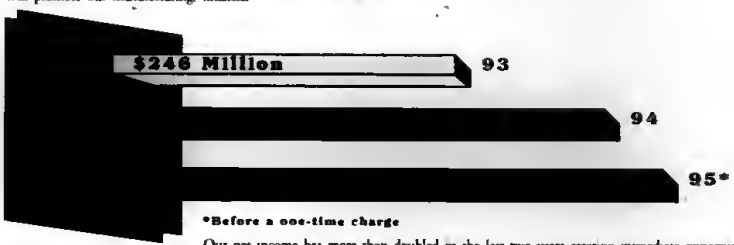

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GROWTH PROSPECTS

By Alice LaPlante

It should come as no surprise that where there's growth, there's usually a happy IS professional

The information systems staff at United HealthCare Corp.(UHC) has had a busy year. Just ask Jim Bradley.

As chief information officer of the $2.5 billion Minnetonka, Minnesota-based healthcare conglomerate, Bradley witnessed his employees' successful completion of a massive electronic data interchange network in December that interconnected nearly 20,000 independent physicians and UHC facilities throughout North America. (Today, that number has reached 25,000). He applauded the October awarding of a U.S. patent to UHC technologists for years of accumulated work applying artificial intelligence techniques to monitoring clinical databases.

Bradley's IS team then embarked in November on devising an open, three-tiered client/server architecture that would aid UHC strategists in creating a new global business model allowing the company to export its healthcare management knowledge worldwide via roll out of distributed Unix applications.

To keep up with this frenzy of activity, Bradley welcomed more than 100 new IS workers into the UHC fold in 1994. He expects to continue luring top technologists to the Minneapolis area to keep up with UHC's growing needs.

"To a great extent, we are a technology company," says Bradley. UHC does not employ the physicians or own the hospitals that belong to the UHC net-

United Health Care's CIO Jim Bradley hired 100 new IS employees in 1994. He considers technologists to be the "lifeblood" of the company

PHOTOGRAPHY BY STEVE WOIT

work; instead, UHC's business value lies in facilitating relationships between healthcare providers, insurers and patients, to achieve higher quality care at the lowest possible cost.

"We're really a brokerage service, and information exchange is at the heart of each transaction," says Bradley. In short, UHC's technologists are its "lifeblood," he adds.

The golden age of IS

This sort of talk is common among the companies on the Computerworld 100 Best Places to Work list. (See page 70 for a complete company listing.) Indeed, United HealthCare is just one among a myriad of firms heralding what appears to be a golden age for technology workers.

A survey of the 100 Best Places to Work companies reveals that organizations in a variety of industries are putting their personnel dollars on the technology barrel – despite downsizing and reengineering – as they staff up to meet the demands of the next millennium. Fifty-five of the Best Places to Work companies increased their staffs in 1994; and IS salaries rose a healthy 4% to 5% at 62 Best Places companies.

Employment projections are even more favorable for 1995 for the Best Places to Work companies; three-quarters say they will create new IS jobs this year.

Many of the Top 100 insist that the growth is not just a temporary blip, but a portent of things to come. "The most frequently asked questions we get from job candidates are: 'How committed are you to your technology strategy?' and 'What will you do if market conditions change and expenses become a problem?'" says Howie Sorgen, senior vice president and managing director at Merrill Lynch & Co. in New York.

Sorgen says technology is so critical to business that he can always assure potential employees that "funding technology efforts will never be a problem."

Transforming the infrastructure

Perhaps the biggest trend fueling the IS staffing increase is the urgent need to transform traditional host-centric architectures into distributed models. The objective: to allow for rapid and flexible expansion into new market niches and geographic locales.

Consider Nike, Inc., for example. The shoe and apparel manufacturer based in Beaverton, Oregon, created 20 new IS positions in 1994, primarily to help develop and roll out client/server applications that will aid in the globalization of its business, according to Bob Kreinberg, vice president of operations.

Among other projects, Nike embarked on a major new distribution management system for Europe that employs wireless communications, paperless workflow applications and real-time order entry processing which interacts seamlessly with U.S.-based host inventory databases.

The fast pace of the athletic apparel business means Nike must introduce new shoe and clothing designs every three months. With this in mind, Kreinberg also staffed up in 1994 to develop a new Oracle-based client/server database that tracks the entire product design cycle and facilitates new product launches and marketing campaigns.

As Nike strengthens its operations throughout Europe, Asia and South America, Kreinberg will need additional IS employees to aid in setting up a global web of distributed LANs and wide-area networks that will allow seamless communication among all Nike sites worldwide.

Similarly, Merrill Lynch continues to "place more empowerment at the desktop, to ensure that we are building the most robust global infrastructure possible for worldwide growth," Sorgen says.

Merrill Lynch has installed more than 20,000 desktop devices around the globe, interconnected through hundreds of LANs and WANs on top of which Merrill developers are layering new generations of distributed applications. To aid in this and other initiatives, the investment bank's IS staff grew at a rate of more than 20% in 1994. Similar increases are projected for 1995, according to Sorgen.

Hot skills

The operative word is desktop. Virtually all new jobs created in the IS shops of the Best Places to Work involved putting new applications on, or connecting to, PCs or workstations — usually within a client/server architecture.

Here's a sampling of where today's hottest IS skills reside:

- **Distributed database design.** Oracle, Sybase, Informix or other DBMS experience that can be used to build strategic applications across a variety of hardware platforms.
- **GUI front-ends.** Windows, PowerBuilder and OS/2 experts are particularly in demand.
- **Workflow and groupware products.** This includes Lotus Development Corp.'s ubiquitous Notes, of course, but also other document-management and electronic forms technologies that enhance group productivity.
- **LAN/WAN design and support.** Anyone who can build or maintain a network can command instant employment.
- **Object-oriented tools.** Visual Basic, C++ and new object-oriented CASE tools that speed application development efforts.
- **Unix administration.** Just now hitting the corporate marketplace, Unix gurus who also understand corporate needs and procedures are extremely scarce. Write your own ticket!

ILLUSTRATION BY JAMES KRAUS

There's also the growing recognition that technology may make a difference – indeed, it may be the only thing that can – when a company is being squeezed by competitors in today's increasingly goods-flooded markets.

75% of the 1995 Best companies plan to create new IS jobs this year.

The Sherwin-Williams Co.'s biggest business challenge these days is the absolute lack of growth in the paint industry – coupled with the escalating cost of doing business. "We're facing a completely saturated market. Total volume is not increasing, nor can we expect it to increase," says Wayne Gacnik, corporate director of MIS.

On top of all this, the paint industry faces rising costs related to complying with new government environmental regulations. Still, Sherwin-Williams has set an ambitious corporate goal to double its annual sales volume every five years — which means expanding its own market share through winning customer loyalties away from competing brands. As with other Best Places to Work companies, Sherwin-Williams depends on technology as a key weapon on the corporate battlefield.

In 1994, Gacnik's staff embarked on an IS project that will use integrated computer telephony, distributed databases and voice-recognition technologies to completely automate Sherwin-Williams' order-taking process.

Its customers – which include hardware stores, home-improvement superstores, contractors and specialty-paint stores – will be able to call Sherwin-Williams' databases 24 hours a day, 7 days a week and place orders by phone. They'll be able to check on existing orders, specify delivery instructions, check on account balances and generally be provided with "a much more convenient way of doing business with us," says Gacnik.

The reason for using voice recognition instead of the touch-tone response systems that are becoming ubiquitous elsewhere, explains Gacnik, is that "many of our customers are small hardware shops or mom-and-pop operations that still don't have touch-tone phones." Giving customers database access is critical to Sherwin-Williams' ambitious growth plan, Gacnik adds.

Squeeze Play

Carrier Computer Services Inc., the IS arm of Carolina Freight Corp., is ramping up to meet what president John Rudasill describes as "the big squeeze" facing his firm. The Cherryville, N.C.-based less-than-truckload shipping company is seeing competi-

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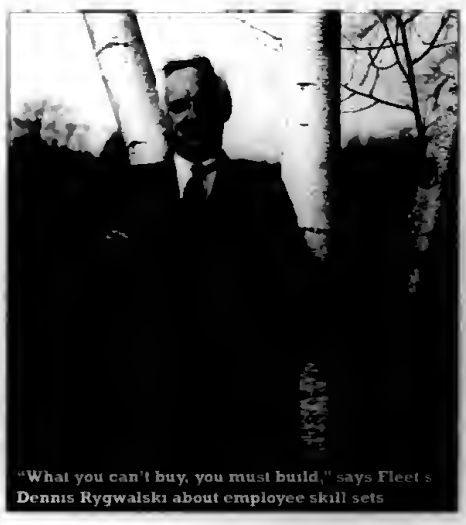
• PROFILE •

FLEET SERVICES *creates a technology blueprint for its financial future*

When the Interstate Banking and Branch Efficiency Act goes into full effect in 1997 – finally allowing banking transactions to cross state lines – $48 billion Fleet Services Corp. will be ready, thanks to a new technology infrastructure currently under construction.

Already, Dennis Rygwalski, executive vice president of management systems development at Providence, R.I.-based Fleet, has jump-started a number of projects that will support 7-day, 24-hour processing cycles with a national scope. This will finally allow real-time positioning of customer transactions around the clock no matter where they happen to be initiated.



"What you can't buy, you must build," says Fleet's Dennis Rygwalski about employee skill sets

Thus a Fleet consumer-banking customer in Iowa will be able to switch on her PC at 3 a.m. and transfer funds from a Rhode Island savings account to a new mutual fund she's just heard about in New York. A Fleet client on business in Florida can stroll over to his local Fleet branch and initiate a transaction on company assets scattered throughout Fleet accounts in a variety of states.

Helping Hands

Making this possible is a large-scale migration from a traditional Big Blue glass house to a distributed architecture. Processing is being off-loaded from the IBM ES/9000 in Fleet's Albany data center to Novell LANs scattered throughout all Fleet sites. PCs are being placed on every desktop; employees with more mobile job responsibilities – loan representatives, for example – have been equipped with notebook computers so they can be on-line and productive whether they are in the office or at a client site.

Not surprisingly, this explosion of information systems activity has required extra helping hands, and lots of them. In 1994, Fleet increased its IS department by a whopping 20%, primarily by adding workers skilled in client/server and networking technologies. And in 1995, Rygwalski is projecting even higher IS employment growth rates.

Of the 58 IS jobs created last year, "virtually all had some sort of PC component," says Rygwalski. The most critical technology skills? Sybase, C++ and PowerBuilder. But like other companies, Fleet has had trouble locating experienced workers. "These people are hard to find," he says.

Rygwalski's solution: training and retraining. "What you can't buy, you must build," he says. Thus Fleet is in the middle of a whole-scale conversion of its IS labor force in an attempt to transform long-time, and highly valued, IS workers with out-of-date mainframe skills into client/server wizards.

Ray Caron, a 13-year Fleet IS veteran, is delighted by the chance to trade in his CICS and Cobol tools for more valuable skills. "Every day is different," he says about the brave new world of distributing computing.

Indeed, Ed Ruggeria, a new employee who started at Fleet last February with 10 years of IS experience in the financial services industry, says it's the company's clear vision in planning for new banking horizons as well as its structured approach to revamping the architecture and technical talent pool that convinced him to come on board.

"A few years ago, Fleet was just a relatively small state bank," he says. "Now we're growing big time." ♦

— Alice LaPlante

PHOTOGRAPHY BY STEVEN LEWIS

Continued from page 18

tion on the low end from single-package carriers such as United Parcel Service and Roadway, and from high-end companies formetly interested only in transporting full truckloads of freight.

In response, Rudasill sought additional IS employees in 1994 to help streamline operations through a distributed Unix-based imaging system that will digitize and automate the formetly arduous paperwork involved in shipping transactions. When finished, everything from bills of lading, to inventory documents, to trip expense reports will be available at the touch of a keystroke. More importantly, when customers request back-up documentation, a common occurrence, they can get exact replicas of any paperwork associated with a freight job faxed to them by simply instructing the Carrier database via a touch-tone phone.

83%
of the Best Places gave their IS staff raises of 4% to 5% in '94.

Not only will this boost customer satisfaction and hopefully help keep market share from eroding as new competitors entet Carrier's matket, but it also keeps operational costs low, says Rudasill. "Because we're increasingly competing with non-union carriers, our labot tates are much highet. We therefore need to streamline in other ways, and technology helps us do this," Rudasill says.

Ace Hardwate Corp., headquattered in Oak Brook, Ill., is likewise beefing up its IS staff in order to more effectively compete against the large home-improvement supetstotes like The Home Depot, Inc. and Builders Square.

One current project under development at Ace is a distributed database called ACEnet Plus. The system allows individual Ace stores to use remote PCs to dial into the Ace corporate mainframe for items that are not locally in stock and facilitate immediate delivery. To achieve this, Ace is heavily recruiting client/server applications developers as well as LAN and WAN network technicians.

"A typical Ace store can only stock 15,000 items," says Don Schuman, vice president of information systems at Ace. "Having electronic access to the 60,000 items in out warehouse means they can more effectively compete with the larger stores that keep more products on the shelves."

Here, there, everywhere

All this is good news for technology workers - particularly those with distributed computing or desktop skills (see Hot Skills, page 17). Courted from

Continued on page 22

• PROFILE •

ENTERGY *places its bet on technology upgrades*

Although partial deregulation is just around the corner, allowing open competition for the utility dollars of consumers and businesses alike, firms such as New Orleans-based Entergy Corp. will still need to comply with the massive portfolio of federal, state, and environmental laws still on the books. "It's the worst of both worlds," says Dennis Walsh, Entergy's vice president and chief information officer.

Entergy is one of the largest investor-owned public utility holding companies in the country, serving 2.3 million customers through 88 coal, gas and oil-fired plants and four nuclear fuel generating facilities located in Arkansas, Louisiana and Texas.

At Entergy, Dennis Walsh's switch to a Unix environment spurred the need for additional employees

Three years ago, chairman and Chief Executive Officer Ed Lupberger – seeing the utilities marketplace fast going the way of the airlines and telecommunications industries in terms of increased competition and eroding profit margins – gave new chief technologist Walsh the green light to run with new information systems initiatives that promised to streamline operations. "I believe that our ability to deal with information effectively is the axis on which this organization will turn," Lupberger says.

Releasing the shackles

But when Walsh walked in the door in 1992, he found a company shackled to the rigid world of mainframe computing: IMS and Cobol were the mainstay of the IS department; IS was regarded merely "as a necessary nuisance," Walsh recalls. Today, desktop technology is the heart of Entergy's IS future, as 10,000 PCs and workstations linked through more than 400 LANs relay what Lupberger correctly recognizes is the utility's lifeblood – information – throughout Entergy's operations.

A quicksilver shift from proprietary technologies to Unix and Open Systems was also in order, Walsh decided. Although in 1992 there wasn't a single Unix installation, today, "we have one of the largest commercial Unix environments in the country," boasts Walsh.

Not surprisingly, all this has lead to a widespread hunt for top technology talent, particularly for experts in client/server development, distributed database design, workflow and imaging.

"We're hiring people with Sybase experience. We're hiring database analysts. We're hiring people who know object technologies, Unix and telecommunications," says Walsh.

But qualified IS candidates are difficult to find. "We'll take talent anywhere we can find it," says Entergy IS recruiter Caron Bettenhausen. This means depending on employee referrals, campus recruiting and advertisements in trade publications, not to mention the attraction that occurs by offering qualified candidates the most challenging work environment.

Ed Bouton joined Entergy last year as manager of network design. "This company is on the cutting edge," he says. And the autonomous culture might not be for everybody, he admits. "We don't have excessive intervention from management because management doesn't have the time. We rely on employees with the capability to work independently."

Which is why Cliff Triplett, Entergy's director of systems design and telecommunications, describes the IS work going on at his firm as "creative and progressive" – not words typically heard from a technology executive.

Says Triplett: "We don't compare ourselves to other utility companies. We compare ourselves to the best."◆

— Alice LaPlante

PHOTOGRAPHY BY PATTI PEARET

Continued from page 20

every direction – corporate IS shops, systems integration houses, management consulting firms – these candidates can literally write their own tickets to employment opportunities. This leaves most IS shops scrambling to fill vacancies.

30%
of the Best Places project staff increases over 10% this year.

UHC, in addition to client/server developers, is always in need of experienced technologists who have worked with Unix on the desktop, particularly with the DCE environment. Unfortunately, says Bradley, "experienced Unix administrators and data communications architects are especially hard to find."

Nike's Kreinberg agrees. "Skilled Oracle and PowerBuilder employees are in very high demand," he says. "When you do manage to find them, you must be prepared to pay a premium. They are usually looking for the most interesting projects, and for guarantees of rapid advancement."

But money isn't everything. More critical still is allowing workers with today's leading-edge skills to keep enhancing those skills.

"You can pay equitably; you can give generous stock options; but if you don't allow the individual the ability to keep up with new technologies, then they feel – quite rightly – that they are mortgaging their future," says Bradley.

Other considerations can help an IS shop attract good candidates, too. Nike, for example, has on its side the fact that the Pacific Northwest is viewed as a prime place to live, with reasonable housing costs, abundant outdoor beauty and a wealth of career opportunities. A plethora of other technology firms – including Intel – have major installations in Oregon, which both helps and hurts Nike during recruiting, Kreinberg says.

"A number of technology companies are drawing off the same talent pool in this area, so it can be quite competitive," he says. On Nike's side is the fact that "there's a positive perception of this company out in the world. We're seen as an exciting place to work."

Ace Hardware offers highly flexible working conditions to help lure attractive candidates to its suburban Chicago headquarters, says IS chief Schuman, who hires most of his new employees from local universities. He finds that "the new generation of IS workers is different in the priority they place on having flexible work schedules, the ability to work at home and telecommute, and a relaxed rules about dress."

An Ace work-at-home program has

Continued on page 25

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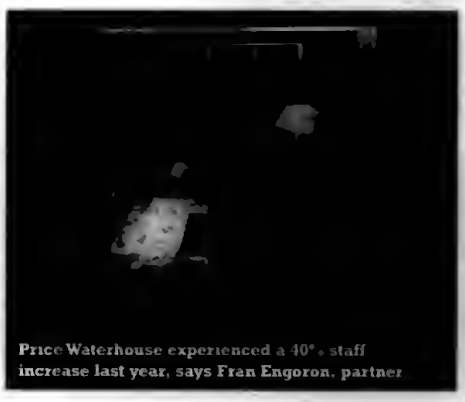
Consultancies: On a hiring binge

Marie Hamilton's top priority when looking for a new job last summer was to find an employer that would offer her access to emerging technologies. A second, related goal was to avoid the mind-numbing routine prevalent in too many corporate IS shops.

An IS veteran with 15 years of experience in the retail and credit management industries, Hamilton's job search led her to American Management Systems, Inc. (AMS). As an AMS business analyst based in New York, Hamilton has already completed an assignment as team leader installing a client/server credit bureau application at telecommunications giant Nynex. Her current project is working on graphical user interface-based applications for another AMS client.

And Hamilton is assured that more – and more varied – assignments will follow. "You simply couldn't get this kind of variety in a corporate IS shop," she insists.



Price Waterhouse experienced a 40% staff increase last year, says Fran Engoron, partner

Astonishing Growth

The upsurge in technical hiring at corporate IS shops is nothing compared to what is happening in the systems consulting industry. In 1994, many consulting houses saw increases of upwards of 30%; in 1995, some third-party IS service providers are predicting even more astonishing growth:

• Andersen Consulting hired 2,500 new employees in 1994, and the consultancy is shooting for 3,500 new hires in 1995, according to David Reed, Andersen's director of recruiting for the Americas.

• Of today's 2,000 Price-Waterhouse technology consultants, 800, or 40%, were hired in 1994. Fran Engoron, a partner in Price Waterhouse's management consulting services human resources department, says she expects this rate of expansion to continue in 1995 and beyond.

• Greg Stanalajczo, president of CDI Computer Services Inc., a $35 million Troy, Michigan-based consultancy, added 100 new employees in 1994. CDI will hire 300 more technology workers in 1995 – a 60% increase.

Ironically, consultants are doing so well now because corporations can't find enough experienced technologists to join their internal staffs permanently; which means "we're competing with IS shops for top-notch workers–including some of the shops of our clients," says Paul Brands, CEO of AMS, who hired 1,500 technology employees in 1994.

But even the most successful consulting firms say finding workers with client/server, distributed-database and telecommunications skills is difficult.

"There's simply not enough [experienced workers with these types of skills] to go around," says Andersen's Reed. Because of this, Andersen depends heavily on campus recruiting. For example, 1,800 of Andersen's 1994 hires were recent college graduates – and on a rigorous $200 million annual training program that provides new employees with an average of 138 hours of formal education annually for the first five years of employment.

The current hot skill set at Price-Waterhouse is SAP expertise. SAP, a German software vendor, was one of the first to introduce a client/server suite of integrated financial applications to the corporate market, and has witnessed "phenomenal growth in the United States," Engoron says.

Indeed, ICS Deloitte, a wholly-owned subsidiary of Deloitte & Touche, in Chadds Ford, Pennsylvania, which expects to pull in $150 million in 1995, derives all its revenue from SAP consulting. Founded in 1991, it now has 500 employees, 260 of which were hired in 1994. And Mike Pehl, president, is looking for 350 good men and women to swell the ranks of his company in the coming year.

As AMS' Hamilton notes, the appeal of the consulting life is strong. The compensation is typically higher than for a staff IS position; the work more varied; and the skills constantly being updated.

"It's exactly what I was looking for," she says. ♦

— Alice LaPlante

PHOTOGRAPHY BY JERRY VALENTE

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COMPAQ

"If You Don't Allow The Individual The Ability To Keep Up With New Technologies, Then They Feel They Are Mortgaging Their Future." — Jim Bradley, UHC

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turned out to be very attractive for employees with families, who can choose a reduced work week or can work out of a home office several days a week. Ace supplies the hardware, software and telecommunications links between home and office, and requires only that the employee has a space devoted to work – "we don't want them working on their kitchen table," Schuman says. That they must also install two dedicated work lines, one for voice and one for data, to insure productivity at home remains high.

Cisco Systems, Inc., the San Jose maker of networking bridgers and routers, depends primarily on employee referrals to satisfy its ever-growing need for top-notch technologists. The company grew its IS staff by more than 20% in 1994, and expects even higher growth in 1995, says CIO Pete Solvik.

Currently, more than 50% of Cisco Systems' new recruits are brought in by existing employees, who get bonuses ranging from $500 to $1,500 for successful candidates, Solvik says. That, plus its reputation as an industry leader in networking technologies, "ensures that we get to pick the cream of the crop," he adds.

Fueling Cisco Systems' strong growth is a decision to take IS out of the backroom and place it into the revenue-generating limelight. Like other Best Places to Work companies, Cisco Systems recognizes that systems originally developed by IS for internal use can actually generate profits for the firm.

Specifically, Solvik is seeking technologists who can help link Cisco's internal transactional customer, order entry, technical support and marketing databases with customers via the Internet's World-Wide Web. The idea, says Solvik, "is that access to much of this internal information is an integral part of the networking products we sell."

Thus, a number of critical modules of new Cisco product development are actually managed from within the IS department. Solvik is also overseeing conversion of all core transaction systems with a distributed Oracle suite of applications simultaneously with the Web project.

Other top 100 companies have similar revenue generating plans for IS. UHC, for example, sees a tremendous opportunity for exporting its healthcare management expertise to emerging markets in Europe and Asia. Because the heart of the management services UHC provides are technology-based, the portfolio of communications, database and workflow applications UHC has developed over the years for internal use is now being sold and distributed as part of UHC's for-profit activities.

Southern states have the best employment growth prospect in 1995

"Other countries are facing the same problems with runaway medical costs that we are; we realized our own managed care solutions could well work on a worldwide basis," says UHC's Bradley.

Home Grown

Finally, many Best Places to Work companies insist that the only way to ensure quality, especially when experienced talent is so scarce, is to grow it yourself. Merrill Lynch does this through an internship program that puts all candidates through rigorous training that includes business as well as technology education.

Of the 125 new hires in 1994, 85 were brought into the Merrill Lynch IS group through this program, says Sorgen. Most of these interns – approximately 70% – are computer science graduates, but the remainder come from a mix of backgrounds. From this intern pool, Merrill grows an IS population rich in client/server development skills, Oracle, Sybase and Informix database expertise, and experience with object-oriented tools like Visual Basic and C++.

Sherwin-Williams' Gacnik agrees with this approach. No newcomer to a distributed IS strategy, Sherwin-Williams has for years been placing Unix processing hubs in the field for distributed processing and currently has more than 2300 Unix servers scattered throughout the country as part of its enterprise WAN.

Thus Gacnik has never depended on finding experienced workers with the knowledge of Oracle, Sybase and C; as one of the pioneers in this area, no such experience was to be found. "We can teach them the technology," he says. "Besides, the technology changes so fast, you are going to have to make investments in training anyway. So it makes more sense to choose the right kind of people."

In Gacnik's case, that means people who "can think for themselves and are willing to express their opinions. I don't have to agree. But show a logical thought process and an excitement about the work, and I'll be impressed."

Most importantly, this approach ensures that "you're guaranteed a worker who will remain productive no matter how much the technology changes," Gacnik says. "That's the best way to prepare for the future." ♦

Alice LaPlante is a freelance writer based in Woodside, Calif.

PHOTOGRAPHY BY STEVE WOIT

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NO PLACE *is the* BEST PLACE

By Michael Fitzgerald

The best American companies are going mobile. Equipping your road warrior with the basics is only the first step — boosting productivity is the tough job. Just ask Xerox.

Distributed computing, extended to its logical limit, means computing wherever work is done: in the home, at the customer site, in the car or on the plane.

The number of companies that are going mobile is impressive. Among *Computerworld's* 100 Best Places to Work companies, for instance, 98% offer employees flexible work time and 72% let employees work at home.

Link Resources Corp., a mass-market research firm, forecasts that the number of telecommurers is likely to double in five years, from 7.8 million to 15 million.

The challenge for information systems organizations is to provide support for the road warrior and telecommuter while remaining a Best Places to Work company. That is, how do you send workers out of the office and still have them work effectively and remain productive? It's a challenge that frustrates many corporations.

Market researcher Culpepper Associates, Inc., for instance, found that most companies rate their mobile sales force implementations a 2.89 on a scale of 5 – not exactly head-of-the-class scores.

Still, the use of roobile technology can make workers lives easier. Take Xerox Corp., the seventh-ranked 1995 Best Place to Work company. Xerox is spending big bucks on technology to make life better for its mobile workers.

In 1992, Xetox realized that it needed to recast itself as a player in the Information Age. This became a corporate imperative when the copier company was suffering flat sales and flagging profits for two years. One thing Xerox decided to do was make better use of technology.

Part of this ongoing, multiyear effort to cut costs and recasr the corporate image involved Michael Radigan, a Xerox program manager at the company's Rochester, N.Y. IS facility.

Radigan and rhe Xerox team took responsibility for implementing a $30 million sales force automarion effort. Their mission: to bring on-line Xerox's 5,700 salespeople in 70 offices across the country.

Xerox's team cut across both information systems and business units. Ir included several top-draw technologists, including Andre Venderbosch, sales force implementation manager at Xerox, better known in Xerox's IS corridors as "The Legend" because of his technical prowess; Paulette Scheffer, who manages Electronic Data Systems' Xerox western technical support center; and Bob Stoughton, an EDS

Continued on page 31

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Behind every Xerox road warrior is a busy IS department

Continued from page 29

account manager for Xerox. Among its business side was Marc Cartignan, a Xerox program manager, whose understanding of the user, Radigan explains, helped the IS professionals "in such a way that we were able to see what [the sales force] needed."

"We were able to engineer the project so it was successful," Radigan says. "But it didn't have to be."

The team discovered that sales people needed three basic things:

1. On-line remote access to mainframe databases.

2. The ability to send information to each other.

3. Specific sales-oriented applications like contact managers and presentation software.

But before any of the bells and whistles, they needed the hardware. In 1994, Xerox equipped every sales person with either a Compaq LTE Elite notebook configured with a 340M-byte drive, a 20/40MHz 486DX2 processor, 8 Mbytes of RAM and a 14.4 Kbits/sec. modem, or the IBM ThinkPad with a minimum 340M-byte hard drive and 33MHz 486SX processor. The cost of equipping the troops? $22 million, says Radigan.

Each notebook comes equipped with Rumba connectivity software, Microsoft Office Suite and Mail products, Delrina Corp.'s WinFax Pro, and Microsoft's Schedule+ calendaring product (though Xerox is now moving to Ecco Software, Inc.'s calendar). Xerox-specific applications, such as presentation templates, are also on the hard disk.

Many of these presentations are best-of-breed proposals that Radigan's group pulled together from the Xerox sales force. The group then preloaded the software on each laptop for each salesperson.

One of Radigan's sales guinea pigs was Joann Halle, now a senior marketing manager at Xerox. In 1993, Halle was a senior sales manager in Xerox's Lexington, Mass., sales office, one of two Xerox pilot sites that Halle managed.

Eighteen months into the project, Halle thinks she's now better able to communicate with her employees. She finds her responsiveness to customer requests vastly improved and says it's easier to sell in some ways. Using mobile technology to demonstrate Xerox's own technology "helps [customers] see us as a technology company," she says.

Xerox's Mike Radigan assembled a team of both IS and business experts to implement a $30 million sales force automation effort.

Mobile mainframe

Providing salespeople with remote, dial-up access to the mainframe proved to be Radigan's biggest challenge. In the bad old days, the typical Xerox employee had no way to connect to the mainframe from the road. So Xerox put a 3Com Corp. AccessBuilder router linked to modem banks into each of its 70 sales offices and also installed one router at the corporate mainframe site in Auburn Hills, Michigan. Users got a Rumba PC-to-mainframe connectivity package as part of the software bundled on their notebooks.

While a router-and-modem setup sounds straightforward, it did take some time to evolve. "It was a lot of work to [get] that piece of [the communications setup] really tuned up," Radigan says. At first, he explains, "the guinea pigs didn't find it easy to get in."

Part of the problem was Xerox's initial decision to use a third-party communications network. While the company thought it would save money using an outside network, the software routines required to connect to these networks were DOS-based, which meant extensive, intricate scripting work that made connectivity a chore for users.

Xerox then tried mixing and matching outside networks before it finally decided to simply install the AccessBuilder routers and modems and give the salespeople direct dial-up access.

The results speak for themselves. Halle now has total confidence dialing in from customer sites to access infor-

PHOTOGRAPHY BY BOB MAHONEY

mation. While she says she initially feared she might get a busy signal, that has not happened.

Halle accesses the mainframe as many as eight times a day, sometimes more. On a typical work day, she powers up her laptop first thing in the morning to check the account status for yesterday's deals. She can poll various corporate databases to see if accounts were approved for credit; whether products were installed when they were supposed to be; and if there are problems with a particular order — a rejected credit application, for instance.

Later in the day, during sales calls, Halle uses remote access to connect into a number of corporate databases that give her as much as 900 specific data elements about each customer. She can find out what pricing deals Xerox has with the customer, for example. She can get an update on the latest pricing promotions, see the customer's service history or credit rating, find out how much Xerox equipment the customer has and where it's installed.

Remote access helps speed the sales process, Halle says, but it's not a panacea. At least not yet. For instance, for each separate aspect of customer information she needs, she has to dial in to a separate database, which consumes time and breaks the flow of meetings.

Easy access

Based on feedback from people like Halle, Radigan's group is preparing to make remote access easier. For instance, instead of salespeople having to dial in to separate databases for different kinds of information, Xerox will have a global data warehouse. The project is supposed to be rolled out in the fourth quarter, though it will take time beyond that to integrate each user into the system. The data warehouse means salespeople can dial one number to access all of the data on the mainframe.

Electronic mail is the other reason Xerox needed remote access for its sales people.

In 1994, Xerox started replacing its proprietary Star network with a Novell, Inc. LAN. Star no longer shines anywhere in Xerox except the corporate offices in Stamford, and Xerox will replace it there sometime in the next two years, as well. Since it invented Ethernet, the company had installed Ethernet wiring everywhere, so building the LAN "was just a question of putting in the servers and plugging it in," Radigan says. The result: Xerox's IS department created an on-line "post office" for E-mail. (The Novell LAN also connects to the 3Comr routers, and sits between users and the mainframe.)

Even though it's the primary way Xerox's mobile workers stay connected, the E-mail system, when first implemented last June, was difficult to use.

Within the first week of putting the mail on the server, "we realized that was a mistake, because [users] would start

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to take down all their mail [every time they dialed in]," Radigan says. So Xerox adjusted its local configuration so that only new mail was available to download, saving money on the connection.

While Radigan's group has made great strides in making the system available to the sales force, he admits that users are not completely happy with it. The biggest limitation is line speed, he says.

Halle seconds that. She doesn't typically check E-mail remotely, because she says it's slower to do so from outside the office. As a sales manager, Halle ends up at the office almost every day, giving her the luxury of direct network access. But that's a luxury many Xerox salespeople can't take advantage of, as many of them can't be in the office as frequently.

Even when in the office, Halle will typically use what she calls the "more timely" technology, voice mail, to communicate crucial messages. This more convenient and more timely mode of communication is available to every person on the sales force. They also have cellular phones so they can check their voice mail.

Joann Halle, a Xerox sales manager and one of the automation team's "guinea pigs," says the new automation technology has helped to speed up the sales process: "It helps [customers] see us as a technology company."

Of course, E-mail can come in handy. If, for instance, Halle's account review turns up a problem, she will check her Novell directory to see if the sales person with the account in question happens to be on the network. If so, she'll use Novell's Messager utility to "flash" over a note that pops up on the appropriate person's screen, with a quick description of the problem.

The Messager utility also has come in handy in crisis situations. Halle recalls the time she was on the network in the office and got a flash from a salesperson in the middle of a call. While working up a pricing sheet for the customer, he made a mistake in the spreadsheet that prevented him from giving the correct total. He couldn't fix it and flashed Halle

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ro see if she could help.

Halle was able to pull up the rep's screen remotely, find tbe problem and fix it. She then flashed him a note saying so. The customer never knew there was a problem. "It was lucky I was in the office and logged on, but it's a very resourceful use of the technology," Halle says. "It saved him a trip back to the office or a phone call that would break up a customer visit."

Radigan says that the flash feature is one reason why Xerox has kept an open ear to salespeople. "We didn't teach them how to do this – they figured it out themselves," Radigan says. IS had expected the flash feature to be used solely by the Xerox help desk, but now they will teach it as a feature in basic sales training, he adds.

E-mail has other uses at Xerox. Distribution of internal documents, new product information, bulletins, price changes and training information all go out over E-mail, as do updated presentation templates. One of the things Halle likes most about the new setup is that policy forms are now digitized and kept on the server, where salespeople can access them, instead of asking their managers for copies of forms they've lost or run out of.

With her cellular phone and laptop computer making work easier, Halle freely admits that her job is more fun since the new technology. And, like other sales people, her schedule is more flexible now.

Still, E-mail technology could be better. "You have an almost infinite list of possible products multiplied by an almost infinite list of configurations," Radigan says. "And you have to come up with a configuration that's very reliable, tries to minimize cost of dial-up and makes it really foolproof for the end user – these things are not where

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they need to be."

For instance, only now are Windows dialers becoming viable in a Novell environment. Currently, dial-up means connecting under DOS, which makes for a longer connection time and requires users to log off to end a session. This was an issue at Xerox, because salespeople would get E-mail and then switch into an application, while they were still logged on and running up telecom charges.

Putting on a show

While the behind-the-scenes technology that Halle has at her disposal is nice, it's in the customer's office where her notebook gets put through its paces. She might start with a 30-minute electronic presentation, then print out brochures from the hard disk or check into various aspects of the customer's account by dialing in to the mainframe.

Although printing brochures sounds simple, this sort of capability is what makes Halle's notebook worth its salt. For instance, printing out product brochures on a laser printer in the customer's office saves her from having to lug armfuls of glossies from office to office.

"We have a ton of products, and you always used to run into the situation where you wouldn't have the one brochure the customer wanted."

Also, monthly marketing actions, which used to be published in book form, now are sent out on disk by the corporate marketing group. This gives sales people instant access to the most up-to-date promotions and pricing information, rather than having it stuck in some thick binder tucked away in the trunk or on a shelf in their office.

Halle also uses the notebook to work through "what if?" pricing scenarios with salespeople, particularly newer employees. Xerox has complex contracts, particularly for multiple unit purchases, so the computer can ease this part of the buying process.

Notebooks also get used heavily at the 4:00 pm managers' meeting. Presentations and training are often the topics of notebook use at these meetings, and where the meeting minutes once took two to three days to be distributed, now, with on-line scribing, action items get turned around immediately.

The notebooks also mean more flexibility. Where Halle and other salespeople used to have to stay late to work on presentations, now they can more leisurely work on them at home.

The bottom line is job satisfaction. Halle freely admits that her job is more fun since she got technology.

Radigan concurs: "This is the best project I ever worked on at Xerox. I thought it brought the company to a higher level, and I felt like I was making a difference." ♦

MICHAEL FITZGERALD IS A COMPUTERWORLD SENIOR EDITOR.

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PC Makes Business Sense

That's politically correct, not personal computer. More and more companies are finding that a diverse workforce pays dividends.

By Debra Bulkeley

Jack Hall, director of computing systems services at Florida Atlantic University in Boca Raton, recalls an incident a couple of years ago when one of his support employees was offended by another employee's remarks during the course of a telephone call.

Tempers flaired. After an "understanding session," which included supervisors and the two employees (representing a total of four cultures), the problem was resolved positively. The upside, says Hall, is a staff that's more aware and knowledgeable concerning cultural differences.

"One of the benefits of a diverse staff is it broadens people's skills who aren't used to working in a diverse environment. It enables the staff to work more effectively within the user community," he says.

The theory goes that a diverse workforce introduces new ideas and experiences into the workplace that may never be considered in a more traditional, homogeneous environment. "You end up with a lot of different points of view," says Allen Gula Jr., chairman and chief executive officer of Key Services, a financial services company and a subsidiary of Key Corp. in Cleveland.

Bob Walker, director of corporare information systems at Hewlett-Packard Co. in Palo Alto, Calif., takes the diversity argument one step further: "Diversity is necessary in order to be a successful firm," he says. "If we don't have a diverse workplace, we're drawing from too narrow a pool of workers." Within HP's information technolgy staff of 1,000 domestically, 39% are women and 22.8% are minorities.

Women represent an average of 38% of IS departments at 99% of the Best Places to Work companies; only 1% of companies say women make up more than 61% of their employee ranks.

Diversity is also critical as companies go global. "Seventy percent of our sales are generated offshore," says Bruce Johnson, vice president, global information technology, at Colgate-Palmolive Co. in New York. "We need an organization that's global to deal with the cultural issues we're faced with continually."

Colgate-Palmolive employs about 800 globally in IS, Johnson says. with 105 employees reporting directly to him domestically. Of those domestic employees, more than one third are women and more than 20% are minorities. Just last year the company began a 2-day management program, called "Valuing Colgate People." Among the topics covered were "Valuing Race and Ethnicity," "Valuing Gender" and "Managing with Respect," Johnson says.

In fact, you could say that Colgate-Palmolive mandates diversity: Bonuses for Johnson's technology group are measured, in part, against the amount of diversity that the organization achieves.

Reader's Digest Association, Inc, is another global company that relies heavily on its diverse workforce for original ideas and information.

"We're proud of our diversity, and we believe it gives us the ability to tap the ideas and experiences of people from different cultures and backgrounds," says Michael Fanning, public relations director.

As one of the most diverse Best Places to Work companies on this year's list, Reader's Digest eotices its new hires with a cotoplete package, which includes competitive salaries, comprehensive benefits, technically challenging projects, advancement opportunities and access to state-of-the-art technology.

And the company does not wait for valuable employees to magically appear. It uses aggressive recruitment techniques and actively seeks prospective staff members from predominately minority universities, intern and co-op programs and recruitment firms specializing in minority placements.

STILL, companies that strive to maintain a diverse staff admit that sometimes it is hard to find qualified women and minorities. Like Reader's Digest, companies try to reach a diverse group of potential employees by recruiting at colleges and hiring interns and co-op students. And they maintain that the broader the pool of people they draw from, the better the chance they'll find the best employees. "There are a lot of talented people out there, and there are a lot of people who haven't been given a chance," says Colgate-Palmolive's Johnson.

There are still many homogeneous IS departments: 54 of the 100 Best Places to Work companies say their IS employee ranks are made up of less than 15% minorities.

So, how do companies foster diversity? Many have affirmative action and diversity programs solidly in place. Many companies, for instance, require managers to attend programs focusiog on diversity issues, ranging anywhere from one to three days. For example, Hall of Florida Atlantic University says all managers attend a one-day cultural diversity training program. HP's Walker attended a similar program at his company that aimed to "sensitize the managers to diversity issues."

OTHER IS managers say that while they are sensitive to diversity issues, the makeup of their IS department is merely a reflection of the demographics around them.

"The community around us is very diverse, so my department is a model of the whole community," Hall says. Sixteen of his 32 employees are women and minorities.

Likewise, Marty Kaplan, executive vice president of Technology and Services for Pacific Bell in San Francisco, says his workforce of 4,300 reflects the diversity of California – about 60% of his IS employees are women and 40% are minorities.

"We have a 25-year evolving effort of being a mirror image of California," Kaplan says.

The *Computerworld* survey also found that the companies with diverse workforces also tend to be progressive in other areas. For instance, many offer employees flexibility in terms of work hours and telecommuting programs, fitness and wellness programs and elder care programs. While these benefits by themselves don't necessarily attract more women and minorities, IS managers say, they are important in the overall recruitment process.

That's the case for Donald Nolen, associate director of application development at North Carolina Central University in Durham, N.C. He says the flexible work schedules appeal to women with young children. "The diversity we offer in terms of benefits compensates for the salary differences we have compared to companies. We just can't compete salarywise with industry," he adds. Other benefits include free tuitioo at 16 public universities, on-site child care

Continued on page 41

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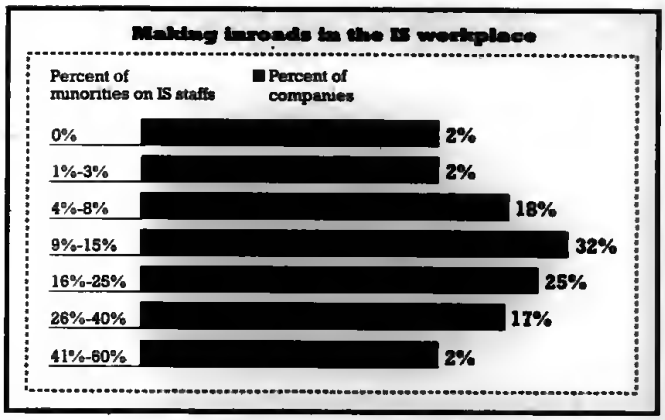
Continued from page 39

and a policy allowing employees to work at home. Nolen's staff of 42 people consists of 41% to 60% women and 26% to 40% minorities.

The IS department at USG Corp., a manufacturer of building materials based in Chicago, was the pilot for USG's telecommuting program last year. Today, about 20% of the IS staff is telecommuting one to three days weekly, says Cristen Bethancourt, a senior systems analyst and co-chair of the Work/Life section of the company's Diversity Program. "We have noticed that the increased productivity has made them more productive," she says. The program was recently expanded to corporate communications, and it will slowly roll out to other departments.



Source Computerworld Survey of the 100 Best Places To Work companies. Not all 100 companies responded

HOWEVER, there are still many companies that don't have diversity in their IS departments: 54% of the 100 Best Places to Work companies say their IS employee ranks are made up of between 0% and 15% minorities.

Part of the reason may be that achieving diversity is an on-going process. "Diversity is still a challenge for us," says HP's Walker. "A lot of issues relate around management style. We had a norm, which was defined by white males and was successful for us and for many other companies, but we need to be more sensitive to other styles now," Walker adds. "Diversity is a lot like information technology – you're never done with it." ♦

DEBRA BULKELY IS A FREELANCE WRITER BASED IN BOSTON, MASS. COMPUTERWORLD INTERN, AMY MALLOY, CONTRIBUTED TO THIS ARTICLE.

Comerica: Creating Equal Opportunities

Understanding and achieving diversity generally doesn't happen overnight; it evolves over time.

Such is the case at Comerica, Inc. in Auburn Hills, Mich. Comerica, which merged with Manufacturers Bank in June 1992, employs 445 people in IS. Of that number, 212 employees are women and 89 are minorities.

Like many companies, Comerica has a corporate affirmative action program. But two years ago, a group of company employees decided they wanted to do even more to make opportunities available to minorities. They formed an ad hoc committee whose goal is to expand and maintain Comerica's already diverse workforce.

"I've had an opportunity to do interesting things that have been appreciated by the bank. As I look back, I want to reach back to help others," says David Rayford, one of the committee's members and a 22-year veteran with Comerica. He is first vice president and director of Architecture and Technical Planning within the company's IS group.

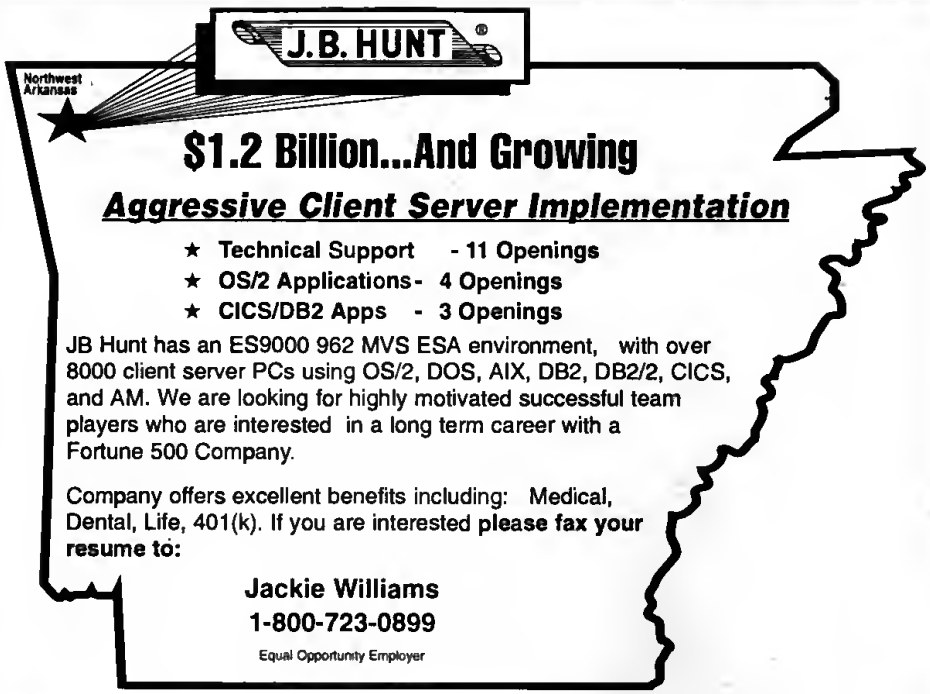
The committee, whose 15 members are black, is also dealing with external issues. For instance, they are educating residents of the predominantly black community about the bank's services. In addition, they are making sure that black employees are "treated fairly" in the bank, Rayford explains.

"There's a heartfelt desire on the part of the executives to work with us on diversity issues. I'm pleased with their response," Rayford says.

Comerica has also instituted a company-wide diversity training program and is working on hiring more minority employees in departments where they are lacking, such as in property appraising. The bank also holds employee meetings that focus on a wide range of topics, including a recent one on the challenges and benefits of a diverse workforce.

Says Rayford, "There are smart people in any race in the world. When you pick the smartest people from all of them, you end up with the best people."

–Debra Bulkeley



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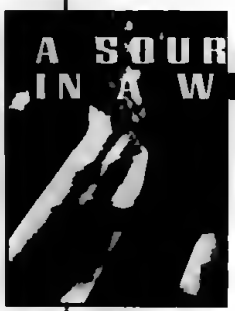

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THE Generation

Not too long ago, most of us had a pretty good idea of what we wanted from our employers: job security, a decent salary, good benefits and maybe a little something for retirement.

For Jay Cox, that no longer cuts it. A senior programmer at Northwestern Mutual Life Insurance Co. in Milwaukee, 24-year-old Cox has his eye on a management position. He also has decided that for now, at least, Northwestern offers him a good shot at that goal. Although he's been with the company for only two years, Cox has been teamed up with actuaries, underwriters and other insurance experts who have broadened his industry knowledge.

"I looked at a lot of companies after graduation," he recalls. "This one develops your whole career. Management gives you a lot of responsibility and lets you go down the wrong path for a while — with a buggy program, for instance. But they don't set you up for failure."

Cox illustrates a clear trend in US business: The responsibilities of information systems professionals who want to rise in the organizaöon or move into other top-level corporate functions, are being redefined to embrace business concepts as well as technical know-how. During the hiring process, "we look for IS people rather than 'computer' people," says Steven M. Lindstedt, Northwestern's assistant IS director. "We pur a high value on interpersonal skills, teamwork, leadership and problem-solving."

As do other Best Places to Work companies, Northwestern develops those talents through on-site courses, industry conferences and specialized training for both the less-experienced and for the growing number of IS veterans who need to acquire new skills, such as

"I Looked At A Lot Of Companies After Graduation. [Northwestern Mutual] Develops Your Whole Career."

— Jay Cox, A Two-Year Veteran as a Senior Programmer at Northwestern Mutual Life

GAP

By H. Garrett DeYoung

How does a company meet the needs of its seasoned IS professionals and those upstart kids straight out of school? It ain't easy.

"The Higher You Go [In IS], The Harder It IS To Keep Up With New Technology"

— Patricia Braeger, Assistant IS Director with 17 Years Experience at Northwestern Mutual Life

PHOTOGRAPHY BY ANDY GOODWIN

graphical user interfaces, distributed computing and object-oriented systems.

Big challenges

IS managers typically find go-getters like Cox to be trouble free. Keep them challenged, give them the right tools and they quickly move up the ladder toward middle management. It's the older, more technically focused IS employees – often weaned on legacy systems – who face the biggest growth challenges. "Five years from now, IS professionals who focus [primarily] on technology will be obsolete," warns Martin Lippert, senior VP of information management and research at Mellon Bank Corp. in Pittsburgh.

In its drive to "personalize" banking through customer convenience, Mellon is now developing artificial intelligence systems to facilitate credit ranking, and videoconferencing for dealing with branch customers. While veteran IS professionals are generally receptive to such innovations, "some of them are a little apprehensive," explains Lee Lapioli, senior VP and chief information officer at New York Life Insurance Co. in New York. "We want to give them a chance [to master new technologies] before we recruit from outside the company."

Developing skills

Skills training is crucial for the novice and the experienced IS worker alike. (See related stories on benefits, p. 58, and training, p. 51.) Take The Gillette Co., in Boston, for example:

"We try to make it easier for people to learn new skills," explains Information Technology VP Patrick Zilvitis, who heads up an IS staff of about 110 in Boston. For one thing, he says, Gillette's global operations "create a lot of poten-

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tial for advancement."

Indeed, some 90% of the company's top 200 executives have been posted overseas. And thanks to Gillette's training seminars, workshops and regular one-on-one meetings between workers and managers, employees get a healthy dose of career development.

"We challenge those who want to change," Zilvitis says. For those who can't or won't embrace the new environment, "sometimes all we can do is to make them comfortable until they near retirement age."

"I feel that I'm being pointed in the right direction," says LAN manager Paul Fife, 28, who has been with Gillette for just one year. "Management gives me the information and feedback I need to advance my career." Fife concedes that he's still sorting out his career options, but notes that his knowledge of networking and connectivity has him nearing certification as a LAN administrator.

"I Feel That I'm Being Pointed In The Right Direction. My Manager Tells Me What I Need To Know To Advance My Career."

— Paul Fife, A LAN Analyst at Gillette for 1 year

For Those Who Can't or Won't Embrace the New Environment, "The Best We Can Do Is To Make Them Comfortable Until They're Near Retirement Age."

— Patrick Zilvitis, Gillette's IT Vice President

And a recent project to install, test and demonstrate a fax server, gave him a lot of confidence. "Within the next year or so, I'll be the one to call for any server problems," Fife says.

Mixing business with IT

The revolution in IS architectures, though, has many companies "looking for people who don't exist," says Brian Hoffman, a partner at search and placement firm Winter, Wyman & Co. in Waltham, Mass.

"IS is no longer the domain of nerds and geeks," Hoffman argues. Although there is still a need for "geeks," companies are hot for workers who know, or who can learn, how technology and business intertwine.

One result: a rise in company training programs and career support at all levels of the firm. However, younger workers are the ones that may move to the head of the class. "Many older workers can't or don't want to adapt," Hoffman says. "They're at risk in this environment."

Perhaps sensing that theory, some veteran IS staffers have seized every opportunity to sharpen their contributions to their companies while simultaneously boosting their careers. At Gillette, for example, research project manager Chris Lojko, a 10-year employee, has worked with LANs, client/server technology and PowerBuilder as part of her goal of taking on one of Gillette's international positions. "I think I have a good chance at that," she says.

Indeed, many more-experienced employees realize that they are at pivotal points in their careers. "I've reached the goal I set for myself several years ago," says Northwestern Mutual's Pat Braeger. A former programmer with a 17-year career at Northwestern, she was recently named assistant IS director. For Braeger, the question is, "What now?" Having sorted out her professional agenda, she says, "there's still alot of room for growth," both inside and outside the IS environment. And while the company has been highly supportive, she recognizes that new techniques present a personal challenge. "The higher you go [in IS], the harder it is to keep up with new technology," she says.

Tripped Up

Even at the best companies, though, IS workers at all levels sometimes trip themselves up. Newcomers, for instance – especially those coming out of top schools – often enter the workforce with unrealistic goals.

"Their expectations tend to be four levels above reality, so we have to get them grounded," says John White, director of business systems at Parker Hannifin Corp. in Cleveland. "Sometimes they have to leave Parker for awhile to see the real world."

Many employees, both young and older, also handicap themselves by declining relocation opportunities. "I explain to people who want higher positions that spots aren't always available in Cleveland," White says. He estimates 80% of his staff are reluctant to venture out into other Parker sites.

If one clear concept emerges from this year's survey, it is the futility of applying labels indiscriminately. Not all newcomers are eager to stretch their wings. "Many of them simply want to build good systems and let someone else kick the tires," Hoffman says.

Just as important, "IS needs to know where the organization is going and how it's doing that," says John Butler, applications services technical director at Apple Computer, Inc., in Cupertino, Calif. Once those goals have been set and communicated, "we try to provide the right opportunities, training programs and career ladders." ◆

H. Garrett DeYoung is a freelance writer based in Scituate, Mass.

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An Ounce Of Training...

By Alan Earls

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At The Home Depot, Inc., Vice President of Information Systems and Chief Information Officer Ron Griffin insists training is the essence of his operation's success. "Instead of hiring specific skills, we like to hire talent," Griffin says. That means taking Cobol programmers and turning them into Unix experts, he explains.

With more than 250 stores and 1994 revenues in the $10 billion range, IS has played a key role in revenue growth for the Atlanta-based building supplies giant and this year's top-ranked Best Places to Work company. Issues such as inventory control and pricing data have become crucial weapons in rapid national expansion — and they all depend on IS.

One of the ways training at Home Depot differs from most operations is how it is provided. "We used to deliver training when people said they needed it," Griffin says. "Now we have made conducting training [an element] in every project. That has boosted training effectiveness and helped the projects along as well," he says. Griffin says the effectiveness of training and people is enhanced by this approach. "We also have computer-based training tools so that people can log on during lunchtime and after hours if they want and add to their skills."

The best companies find the bigger the training budget, the higher the productivity

Growth and training

No matter what the style of training, this year's survey of Best Places to Work companies identifies a strong correlation between growth rates of IS organizations and the average amount of training that companies provide their IS professionals — the high growth firms, in general, tend to do more training.

The inverse is also true: Low growth companies tend to do less training.

Consider Loctite Corp. in Hartford, Conn. which has a growth rate of IS personnel in the low single digits and provides an average of five days of tming a year. The

Continued on page 53

ILLUSTRATIONS BY PETER HOEY

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company uses a less than typical quota system for training providing each of its IS employees with one personal and one job related seminar annually. Suzanne Morello, manager of administrative systems, notes that individuals choose which seminars they want to attend.

Of course, approaches to training differ greatly among companies. Harrisburg, Penn.-based AMP Inc. is also a low growth firm — logging no increase in staff last year — and averages just five days of training a year per employee. Yet, Director of System Services Ron Vance asserts the numbers don't fully reflect AMP's support for on-the-job learning. "If there is any skill you need to do your job, you will acquire it," he insists. "There is no quota. If you need it, we will invest in you."

What's more, says Vance, training at AMP has been made part of the IS organization's mission. For instance, he says, every analyst's job description has the expectation that they will help both peers and subordinates.

Like many Best Places to Work firms, AMP relies on consultants and on both internal and external computer-based training tools to help its people acquire new knowledge. "We have a metric of a minimum of 40 hours per employee per year, but what you need is what you get. So our budget for training has ended up doubling in the last two years," Vance says.

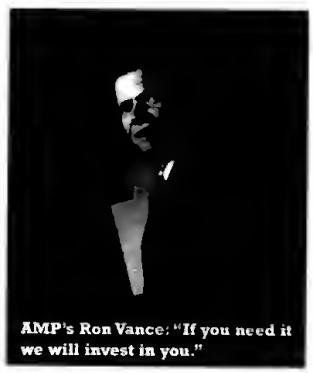
By contrast, Harry R. Adams, director of IS & technology at Outboard Marine Corp. in Waukegan, IL, reports a somewhat different attitude. A high growth firm — more than 20% a year — that provides a relatively low average of four to six days of training a year, Adams says management determines

Ticket to the Top

Although Best Places to Work companies frequently provide extra training opportunities for those deemed to be management material, only a few are setting up a formal grooming process. Indeed, many still offer a rather lonely climb for top job seekers.

Companies that come close to having a structure for future managers include Sears, AMP, Freddie Mac and Computer Associates International.

- At Sears, a new system of rotating IS stars into a range of fields couples with a strong overall emphasis on training.
- AMP also has a niche carved out for its IS leaders. "We have management succession planned three layers down into the organization," explains Ron Vance, director of systems services. One of the results of the succession plan is a tendency to think about skill development in up and coming managers.
- Freddie Mac provides a highly structured, two-tiered management training curriculum. Level one prepares individuals for entry-level management responsibilities, while level two is geared toward preparing high-potential individuals for roles in senior management.
- Computer Associates, in Islandia, N.Y., focuses on management potential from the get-go. Lisa Mars, senior vice president of human resources, says CA usually picks about 75 new college graduates each year to be moved into a range of development projects and turned into CA's "best and brightest." In turn, some members of this select crop will end up in management careers.



AMP's Ron Vance: "If you need it we will invest in you."

Parallel tracks

CA's Mars is quick to stress that within the organization, there is no "up or out" thinking. "Technical contributors and managers are treated as having equal importance," she says.

Others, like Outboard Marine, count on "responsibility and freedom" as the primary means of getting would-be managers to strut their stuff. "We begin by providing hands-on and on the-job training," says Harry R. Adams, director of IS & technology.

Echoing those sentiments, Glen Johnson, acting CIO at the U.S. Arms Control and Disarmament Agency, says "those that show promise get project management responsibility." From there, at some point, managers-to-be get shunted through one of the federal government's management schools, such as the one operated by the Office of Personnel Management, Johnson says.

Also focusing first on old-fashioned gumption is Phillips-Van Heussen Corp., in Ozark, Ala. There, proving you have the right stuff comes first. Then it's up to management to point you in the right direction and get you whatever else — training included — that you might need.

"I'm a classic example," says Tod Jones, a Phillips computer services manager.

– Alan Earls

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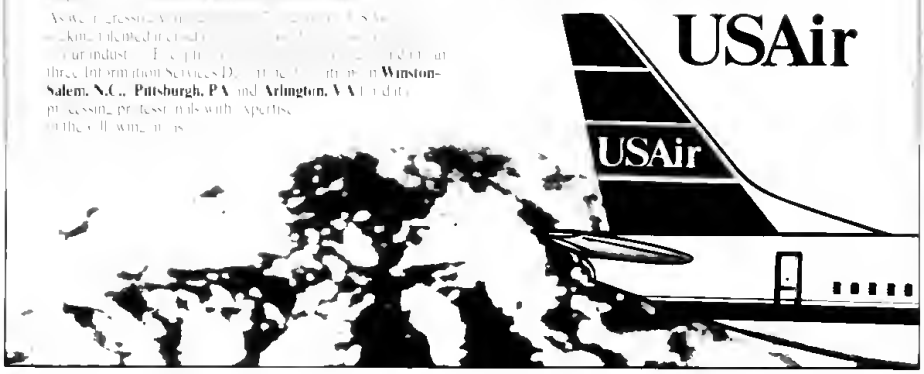

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who get trained on a [illegible] — often well in advance.

Home Depot, a high growth company *and* a strong believer in training, delivers training on a case-by-case basis, too. Home Depot's strategy of hiring bright, ambitious self-starters goes hand-in-hand with a philosophy of letting employees determine their training needs. The theory is that self-starters are not bashful about asking for the training they need to succeed. Says CIO Griffin: "We have some people who may get as much as a month of training in a year and others who just get a week."

Home Depot has a new self-direction program that focuses on "soft skills," which include leadership, time management and how to manage stress. "It's targeted at the needs of a growing organization and also to our emphasis on empowered workteam approach to problem solving," Griffin says.

DAYS IN THE CLASSROOM

- 49% of Computerworld's Best Places to Work companies provide between 7 and 10 days of formal training per employee each year
- 9% provide more than 20 days of training per year
- Only 3% offer fewer than 4 days of training per year

Training in the beltway

The recipients of training are solidly in the drivers seat at the U.S. Arms Control and Disarmament Agency, a high growth federal operation with a strong emphasis on training. "We expect our own people to earmark 10% of their time for training," says Glen Johnson, ACDA's acting CIO. In addition, training is delivered based on suggestions from each employee that are embodied in a set of individual training plans, he says.

Johnson notes that the agency also uses a large number of contractors. They too are eligible for training, if the skill is one that is judged to be more or less unique to the agency's needs.

Another beltway organization, the Federal Home Loan Mortgage Corp. also boasts high growth and a strong emphasis on training. Eric O'Dea, Freddie Mac's director of business management services, says that because of the size of the IS organization (some 750 people), a range of methods are used to determine who gets what training. In some cases, formal management plans identify long-range departmental training goals. In other cases, "it might be something an employee has read about."

"Whatever the training is, we'll pay for it," O'Dea says.

Self starters at Home Depot get the right training. From left: Danny Glenn, Nanette Hilley, Ron Griffin, Chick Wells and Therese Schureck.

Management mandates

Sears Roebuck & Co., in Chicago, probably comes closest to being management-driven in its training delivery. Indeed, IS employees are required to take a minimum of 10 days of training per year. Only Illness or business necessities postpone the obligation. What's more, IS staff members are expected to come up with at least three skill goals for themselves annually as part of their review process.

Sears spokesperson Jan Drummond links this gung-ho training approach to Sears' recent restructuring. "This is an extremely strong policy," she says, noting that "management sees personal growth as the key to advancement."

Specifically, Drummond says, Sears has focused on IS as an area crucial to the company's prospects. "In my position," she says, "I am encouraged to take whatever courses my boss and I decide are appropriate for me. IS is a special case; in IS, [training] is required."

Most Best Places to Work companies would agree. ♦

ALAN EARLS IS A FREELANCE WRITER BASED IN FRANKLIN, MASS.

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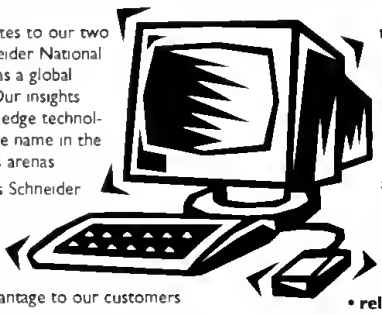

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BENEFITS:

HOW MUCH IS ENOUGH?

That depends. Not all companies have to offer elaborate benefits packages to attract and keep their IS professionals happy.

By David Weldon

When information systems professionals at FedEx Corp. fill out their annual employee surveys, they pay careful attention to the question about what they would like to be doing in a year.

Employees at the Memphis, Tenn.-based company know their answer will determine training programs – and advancement – for the next 12 months. They want to make sure they're getting the right skills for the job – and for their resumes.

Sound disloyal? Perhaps. But transferable skills are in demand as a part of many corporate benefits packages, where employees are often more concerned with impressing a future employer than with building a retirement nest egg.

"In the IS field, careers are tending to be shorter and people are moving around more," says Rick Nordtvedt, senior manager of development at FedEx. "Our emphasis will be less on long-term employment, and more on the development of skills. Learning opportunities are now what's critical at any organization."

At FedEx, those learning opportunities take the form of a variety of skill-enhancing options. For example, employees can choose from several in-house training programs. The goal is to "let employees manage their own development," Nordtvedt says.

"Learning opportunities are now what's critical at any organization."

— *Rick Nordtvedt, FedEx*

FedEx is no exception. Because the IS workforce is more mobile, IS professionals everywhere are less concerned with elaborate benefits. The new emphasis is on training – technical, business and communication skills – to guarantee an individual's future employability. (See Training story page 51.)

"People have to be thinking about their future skills and needs," insists Robert Monastero, director of human resources at Xerox Corp. in Rochester, N.Y.

Still, Monastero admits, the focus on training is far from institutionalized. "Many companies are talking about it, [but] I question how many are walking the walk," he says.

"Training is always the first to go in many companies, when money gets tight," agrees Stuart Kazim, vice president of worldwide operations and information systems at Lotus Development Corp. in Cambridge, Mass.

But, paradoxically, ask Kazim to name the must-have IS benefits and he puts technical training at the top of the list.

"Technical training is a must in this industry,

everything is changing so fast," he says.

To help employees keep pace, Lotus now offers a "catalog of courses" for employees, Kazim says. Most in-house courses focus on management skills, problem solving, negotiation skills and interpersonal skills. Specialized technical training is offered through outside contractors.

Making a contribution

Besides training, IS employees want to feel challenged by their work and see the contribution it brings to the organization. IS managers agree that this is another area where companies need to place greater emphasis.

"We have a different work culture today. The benefits a company must offer include a challenging work environment, with work that creates results that can be measured," says Katherine Holland, vice president and chief information officer of PECO Energy Co. in Philadelphia.

While not part of a formal benefits package, providing a sense of contribution is one of the biggest attractions for employees at PECO, Holland claims. "We're using a lot of leading edge technology. All of our people are working on new stuff. And they're seeing more closely how what they're doing is impacting the business."

Xerox's Monastero echoes Holland: "People enjoy that we're on the leading edge of technology implementation, rather than just creating shelfware."

Employees are also encouraged to share their opinions at Xerox. "We train to a diversity of opinions. In order to bring out the best opinions, we reward communication. We take risks by standing up to issues, and this is treated as a constructive process. It's an open and informal environment that attracts people," Monastero says.

It's all part of feeling empowered and being given the chance to take risks, which many companies strongly believe in.

"Our employees are encouraged to participate [in decision making], and responsibility is pushed down the line as much as possible," explains John Brucken, manager of information systems at American Greetings Corp. in Cleveland. "Managers explain the expectations and the job that needs to be done, then the employee is empowered to decide the ways to do it."

What to offer

Besides empowerment and exposure to the leading edge, there are, of course, some basic benefits that companies must offer their IS professionals.

Many companies are finding they can eliminate certain traditional items such as pension plans and profit sharing without affecting their ability to recruit qualified staff

To evaluate its own benefits package, PECO Energy recently appointed a special team of IS and human resources members to look at different compensation plans for IS personnel at other organizations. "We are looking at issues such as: Are we offering the right compensation? Do we want to structure bonuses differently? Do we want to put more salary at risk?" Holland says.

What the PECO team is discovering is that while certain standard offerings, such as medical and dental insurance, still apply across the board, other benefits can vary dramatically from one company to another, Holland says.

In the past, many companies offered a wide variety of benefits to all employees, regardless of how many employees were likely to take advantage of each. But with IS professionals staying with an employer often for only two or three years, many companies are find-

Continued on page 62

Case Study: Xerox

Self-serve benefits plans. Xerox Corp. is one of a growing number of companies offering cafeteria-style benefits. Xerox gives each employee $4,000 to spend as they wish on a "menu" of benefits. In August, Xerox plans to launch a pilot program that will let employees choose from benefits not on the menu, says Human Resources Director Robert Monastero.

Something for a rainy day. Xerox knows that, at one time or another, everyone could use a bit more cash to cover an important investment or an emergency expense, so it created a program called the "Life Cycle Assistance Program." According to Monastero, every employee can borrow up to $10,000 for a major one-time need.

Don't go home without one. Recognizing that employees work long hours — including at home — Xerox plans to give all 70,000 employees their own laptops within the next two years. (See mobile computing story, page 29.) The goal? Give workers complete control over their schedules and, therefore, their productivity.

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(Dept. JI-ORM-102)

Requires experience in a minimum of 2 of the following:

- ❑ IEF
- ❑ UNIX (Dynix/ptx)
- ❑ Visual Basic
- ❑ Oracle Tools
- ❑ C/C++

SYSTEM ANALYSTS

(Dept. JI-ORM-202)

3 of 5 skills are necessary:

- ❑ Full life cycle
- ❑ Structured analysis
- ❑ CASE tools
- ❑ JAD/RAD
- ❑ Interviewing skills

QUALITY ASSURANCE ANALYSTS
Software Testing

(Dept. JI-ORM-302)

Requires experience with:

- ❑ Use of testing standards (e.g. MIL-STD-2167A)
- ❑ Development of test plans, strategies, scenario/scripts
- ❑ Execution of test plans
- ❑ Interaction with development staff and end-users

Experience in the following is a plus:

- ❑ Programming
- ❑ Knowledge of CASE tools/methodology
- ❑ Automated test tools

TECHNOLOGY SPECIALIST
Information Engineering Support

(Dept. JI-897)

Successful candidate will be responsible for the following:

- ❑ Testing new releases of the developer's tool set
- ❑ Integration of new technologies
- ❑ Assisting in supporting developers

Must have 10 years experience including IEF and a minimum of 3 of the following:

- ❑ Client/Server Development
- ❑ Full Life Cycle IEF
- ❑ Hot Line Support
- ❑ UNIX
- ❑ Oracle V7
- ❑ Tool Integration
- ❑ Excellent oral/written communication skills

DATA ADMINISTRATORS

(Dept. JI-501)

Must possess a minimum of 5 years experience with expertise in each of the following:

- ❑ Applications Development
- ❑ Data Modeling
- ❑ IEF Model Management
- ❑ Systems Integration
- ❑ IE Methodology
- ❑ Full Life Cycle IEF Methodology

SENIOR TECHNICAL SPECIALIST
ARCHITECTURE

(Dept. JI-881)

Successful candidate will be responsible for the following:

- ❑ Guiding the design/implementation of open distributed systems
- ❑ Leading negotiations with key technology vendors
- ❑ Providing systems integration for software solutions
- ❑ Maintaining awareness of critical industry standards
- ❑ Applying statistical/quantitative methods and models

Requires the following:

- ❑ Minimum 10 years related experience (PhD preferred)
- ❑ Knowledge of related distributed databases (Oracle preferred), TCP/IP networking and UNIX
- ❑ Indepth client/server architecture experience

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Continued from page 60

ing they can eliminate certain traditional items such as pension plans and profit sharing without affecting their ability to recruit qualified staff.

The rising costs of medical insurance, child care and elder care, for example, are forcing companies to limit their participation in these areas. Many IS and human resource managers are finding that the cafeteria-style approach to selecting benefits allows employees to affordably retain the same levels of coverage.

Lotus, for example, has offered a cafeteria-style approach for three years, Kazim says. This was "an effort to match the benefits to the different needs of the employees, and also to control costs."

The software vendor gives people so many benefit dollars, and they pick and choose. Choices include benefit categories such as medical insurance,

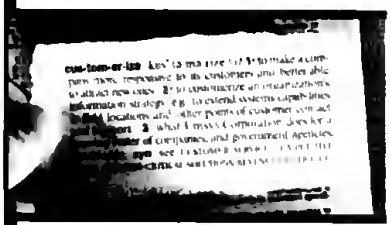
Continued on page 64

Case Study: Lotus

Two for one. Lotus Development Corp. is finding that, for certain jobs, there are often twice the amount of qualified people available. But that's OK, because in many cases people are job sharing anyway. Lotus encourages job sharing and currently has 40 employees sharing 20 job positions, says Stuart Kazim, vice president of worldwide operations and information. So far, it's most common in support and staff positions, he says.

Will you still feed me, when I'm 64? Many companies find that pension plans are no longer in high demand. The reason: their employees are generally younger and don't stay more than two or three years with the same company. But that picture will probably change in the next few years. "Social Security is going to become more of an endangered item for the general population. As a result, ratirement plans will become more important to employees," says Lotus' Kazim.

Defining the Way Business is Done



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PROGRAMMER
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dental insurance, vision care and on-premises child care, Kazim says.

Pressure on managers

Deciding on the right combination of benefits is also forcing managers to get a better pulse on the needs of their IS employees.

This has been given top priority at PECO Energy, following the complete restructuring of the IS department last year. In that wake, IS management is concerned that employees are being properly evaluated and rewarded for what are often new roles

"Many new job titles were created, forcing us to reevaluate the work they do," Holland says of many of her staff. "We want to make sure we're properly taking care of our people."

Adding to the challenge of matching benefits and rewards to performance, Holland says, is the company's grow-

Continued on page 66

Case Study: FedEx

Go to the head of the class. IS employees at FedEx are rediscovering the classroom. The company offers liberal tuition reimbursement programs to help develop both professional and interpersonal skills. "To keep pace with changing technology is almost impossible without a small [human resources] army," says Rick Nordtvedt, senior manager of development. "It's an important way to continue skill-set development. Lifelong learning is an important thing we can offer employees," Nordtvedt says.

Bravo! Bravo! Borrowing from the "Bravo/Zulu" concept used by the Armed Services, FedEx has embraced a rather military approach to rewarding good deeds. The company launched a program that lets managers reward any employee for good work, on the spot and without permission. Rewards include a variety of perks, from dinner gift certificates to company store coupons to cash bonuses. "They can take any form," says Rick Nordtvedt. "It's our most fun program, and the employees love it."

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Continued from page 64

ing use of IS teams. While PECO has not yet implemented peer performance reviews as a factor in compensation, Holland expects it will have to. In many cases, she says, the IS manager is no longer the best person to evaluate an individual's performance.

"The challenge for managers is going to be to agree on what it is the employee should be doing, and how to measure whether they're reaching [these goals]," Holland says.

But it's not enough to just measure whether employees are getting the job done. Managers also need to measure how satisfied employees are on the job. And to make sure managers get it right, companies often tie a portion of the IS manager's salary to the levels of job satisfaction reflected on surveys of their personnel.

For example, at Xerox, employee satisfaction is one of four factors that determine bonuses for managers, according to Monastero. The other factors include customer satisfaction, productivity and business results.

Monastero says by letting employees know that their bosses are being judged on employee satisfaction, "it gives an employee a sense that, 'My deliverables are a part of the overall goals.'" ◆

DAVID WELDON IS COMPUTERWORLD'S ASSOCIATE EDITOR, MANAGEMENT

What IS Professionals Want

An informal survey of IS managers reveals the benefits they prefer

THE BASICS	SHOULD PROVIDE	WOULD BE NICE
★ Atmosphere of respect	★ Life insurance	★ Child care
★ Challenging work	★ Recognition rewards	★ Elder care
★ Employee empowerment	★ Pension plan	★ Option to telecomute
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The Best

The difference between being a good place to work and being a Best Place to Work is like the difference between the bush leagues and the majors. It's more than a matter of degree; the game is played in a different ballpark.

The dimensions of the field are no different. But the caliber of the play is higher, the venue is nicer and the grass is greener. For employees and employers alike, there is something that sets the work environment apart at Best Places companies.

This year's list of *Computerworld*'s 100 Best Places to Work list includes many best-in-class companies spanning 15 industry segments, including government and educational institutions. (See page 6 for industry listing.)

What follows is a ranking from one to 100: *Computerworld*'s pick of the top companies to work for in the U.S. ♦

THE COMPUTERWORLD

Rank	Company	Industry	Location	New IS hires in 1994
1	The Home Depot, Inc.	Wholesale & Retail	Atlanta, Ga.	80
2	Computer Associates International, Inc.	Computer Hardware, Software & Office Equipment	Islandia, N.Y.	1684
3	V.F. Corp.	Apparel, Jewelry & Consumer Products	Reading, Pa.	100
4	Suntrust Service Corp.	Financial & Professional Services	Atlanta, Ga.	150
5	Cisco Systems, Inc.	Computer Hardware, Software & Office Equipment	San Jose, Calif.	80
6	National Semiconductor Corp.	Computer Hardware, Software & Office Equipment	Sunnyvale, Calif.	20
7	Xerox Corp.	Computer Hardware, Software & Office Equipment	Stamford, Conn.	38
8	Reader's Digest Association, Inc.	Printing & Publishing	Pleasantville, N.Y.	20
8	Entergy Corp.	Telecommunications & Utilities	New Orleans, La.	18
10	Informix Software, Inc.	Computer Hardware, Software & Office Equipment	Menlo Park, Calif.	15
11	Key Services Corp.	Financial & Professional Services	Cleveland, Ohio	100
12	Merrill Lynch & Co.	Financial & Professional Services	New York, N.Y.	538
13	Parker Hannifin Corp.	Industrial, Farm & Transportation Equipment	Cleveland, Ohio	10
14	United HealthCare Corp.	Pharmaceuticals & Healthcare	Minneapolis, Minn.	100
15	Avon Products, Inc.	Apparel, Jewelry & Consumer Products	New York, N.Y.	34
16	The Chase Manhattan Bank, NA	Financial & Professional Services	New York, N.Y.	382

PHOTOGRAPHY BY ARES/GOLDRING STUDIO

Places to Work

METHODOLOGY

The selection process for *Computerworld's* 100 Best Places to Work list was based on two criteria: a peer evaluation and a self evaluation. First, *Computerworld* developed a short list of candidate companies gathered in 1994 from a survey of more than 1,500 information systems managers, asking for nominations of outstanding IS organizations within their industry.

We then combined this list of about 600 nominations with the top 250 companies on the Fortune 500 list of industrial and service firms. This group of over 850 organizations throughout the country — including corporations, educational institutions and government agencies — became the population for our self-evaluation survey.

We asked these 850-plus organizations for information on a wide range of issues, including IS salary levels, salary growth, benefits, staff growth, training, staff diversity, organizational communications and the use of technologies. The final 100 Best Places to Work companies were selected based on a total score across these eight categories. We gave equal weight to each category.

The survey was conducted by Trish Information Services, in Hayward, Calif., during February and March 1995.

100 BEST PLACES TO WORK

IS Staff Changes		Average Salary Increase		IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity	
Actual 1994	Projected 1995	Actual 1994	Projected 1995			Women	Minorities
10% to 20%	10% to 20%	6% to 8%	6% to 8%	26%	11 to 15	41% to 60%	16% to 25%
10% to 20%	20%+	6% to 8%	6% to 8%	15% to 25%	20+	41% to 60%	16% to 25%
10% to 20%	1% to 4%	5% to 8%	6% to 8%	5% to 10%	7 to 10	41% to 60%	9% to 15%
0%	10% to 20%	9% to 10%	9% to 10%	16% to 25%	15 to 20	41% to 60%	26% to 40%
20%+	20%+	6% to 8%	5% to 8%	15% to 25%	7 to 10	26% to 40%	26% to 40%
5% to 9%	5% to 9%	4% to 5%	4% to 5%	11% to 15%	11 to 15	26% to 40%	9% to 15%
5% to 9%	10% to 20%	4% to 5%	4% to 5%	16% to 25%	7 to 10	26% to 40%	16% to 25%
-1% to -4%	1% to 4%	4% to 5%	4% to 5%	5% to 10%	7 to 10	NA	41% to 60%*
0%	5% to 9%	4% to 5%	4% to 5%	16% to 25%	20+	26% to 40%	16% to 25%
10% to 20%	10% to 20%	6% to 8%	6% to 8%	16% to 25%	11 to 15	26% to 40%	9% to 15%
1% to 4%	1% to 4%	4% to 5%	4% to 5%	11% to 15%	20+	41% to 60%	4% to 8%
20%+	20%+	6% to 8%	6% to 8%	16% to 25%	7 to 10	41% to 60%	26% to 40%
10% to 20%	10% to 20%	4% to 5%	4% to 5%	16% to 25%	7 to 10	41% to 60%	9% to 15%
10% to 20%	5% to 9%	4% to 5%	4% to 6%	16% to 25%	11 to 15	41% to 60%	4% to 8%
1% to 4%	6% to 9%	4% to 5%	4% to 5%	11% to 15%	7 to 10	26% to 40%	9% to 15%
0%	1% to 4%	5% to 5%	6% to 5%	11% to 15%	11 to 15	26% to 40%	26% to 40%

* Includes women NA = Not available

Rank	Company	Industry	Location	New IS hires in 1994
17	First Chicago Corp.	Financial & Professional Services	Chicago, Ill.	50
18	Fleet Services Corp.	Financial & Professional Services	Providence, R.I.	58
19	James River Corp.	Forest, Metal, Building & Glass Manufacturers	Richmond, Va.	200
20	Mayflower Transit Co.	Transportation	Carmel, Ind.	6
21	Mellon Bank Corp.	Financial & Professional Services	Pittsburgh, Pa.	125
22	Sears Roebuck & Co.	Wholesale & Retail	Chicago, Ill.	1000
23	3Com Corp.	Computer Hardware, Software & Office Equipment	Santa Clara, Calif.	15
24	Barnett Banks, Inc.	Financial & Professional Services	Jacksonville, Fla.	60
25	Carolina Freight Corp.	Transportation	Cherryville, N.C.	8
26	Massachusetts Mutual Life Insurance Co.	Financial & Professional Services	Springfield, Mass.	100
27	Lotus Development Corp.	Computer Hardware, Software & Office Equipment	Cambridge, Mass.	50
28	Maytag Corp.	Apparel, Jewelry & Consumer Products	Newton, Iowa	20
29	U.S. Arms Control & Disarmament Agency	Education & Government	Washington D.C.	7
30	Colgate-Palmolive Co.	Apparel, Jewelry & Consumer Products	New York, N.Y.	3

Setting the Pace for Excellence

Pinkerton Computer Consultants has been a recognized leader in the Information Technologies services business since 1967, and currently employs over 650 consultants in seven locations throughout the Northeast. Our reputation for excellence is unmatched, as is evident by our client loyalty. Pinkerton is involved in every aspect of the systems development life cycle, and is currently seeking skilled professionals in the following areas:

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100 BEST PLACES TO WORK

IS Staff Changes		Average Salary Increase		IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity	
Actual 1994	Projected 1995	Actual 1994	Projected 1995			Women	Minorities
20%+	10% to 20%	4% to 5%	4% to 5%	16% to 25%	7 to 10	26% to 40%	26% to 40%
10% to 20%	20%+	4% to 5%	4% to 5%	16% to 25%	7 to 10	26% to 40%	4% to 8%
-10% to -20%	1% to 4%	4% to 5%	4% to 5%	16% to 25%	20+	26% to 40%	26% to 40%
0%	5% to 9%	4% to 5%	6% to 8%	11% to 15%	11 to 15	26% to 40%	9% to 15%
1% to 4%	1% to 4%	4% to 5%	4% to 5%	1% to 5%	11 to 15	26% to 40%	4% to 8%
10% to 20%	10% to 20%	NA	NA	16% to 25%	7 to 10	26% to 40%	16% to 25%
5% to 9%	10% to 20%	4% to 5%	4% to 5%	6% to 10%	7 to 10	41% to 60%	26% to 40%
5% to 9%	5% to 9%	4% to 5%	6% to 8%	6% to 10%	7 to 10	41% to 60%	16% to 25%
5% to 9%	5%	6% to 8%	6% to 8%	6% to 10%	11 to 15	41% to 60%	16% to 25%
0%	0%	6% to 8%	9% to 10%	11% to 15%	7 to 10	41% to 60%	9% to 15%
10% to 20%	10% to 20%	4% to 5%	4% to 5%	6% to 10%	7 to 10	26% to 40%	9% to 15%
20%+	10% to 20%	4% to 5%	4% to 5%	6% to 10%	7 to 10	26% to 40%	4% to 8%
10% to 20%	10% to 20%	4% to 5%	4% to 5%	20%	20+	26% to 40%	41% to 60%
-5% to -9%	-1% to -4%	6% to 8%	6% to 8%	11% to 15%	7 to 10	41% to 60%	16% to 25%

NA = Not available

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- DB2
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Rank	Company	Industry	Location	New IS hires in 1994
31	Federal Home Loan Mortgage Corp.	Financial & Professional Services	McLean, Va.	132
32	Levi Strauss & Co.	Apparel, Jewelry & Consumer Products	San Francisco, Calif.	50
33	Nationwide Mutual Insurance Co.	Financial & Professional Services	Worthington, Ohio	8
34	Pacific Bell	Telecommunications & Utilities	San Ramon, Calif.	276
35	AMP, Inc.	Electrical, Electronic & Photographic Equipment	Harrisburg, Pa.	33
36	Amgen, Inc.	Pharmaceuticals & Healthcare	Thousand Oaks, Calif.	40
37	Apple Computer, Inc.	Computer Hardware, Software & Office Equipment	Cupertino, Calif.	30
38	FedEx Corp.	Transportation	Memphis, Tenn.	75
39	Hewlett-Packard Co.	Computer Hardware, Software & Office Equipment	Palo Alto, Calif.	140
40	Phillips-Van Heusen Corp.	Apparel, Jewelry & Consumer Products	Ozark, Ala.	1
41	Polaroid Corp.	Electrical, Electronic & Photographic Equipment	Cambridge, Mass.	5
42	Quantum Chemical Co	Chemicals, Petroleum & Plastic Manufacturers	Cincinnati, Ohio	12
43	Trinity Industries, Inc.	Forest, Metal, Building & Glass Manufacturers	Dallas, Texas	8
44	Turner Corp.	Construction & Real Estate	New York, N.Y.	1

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100 BEST PLACES TO WORK

IS Staff Changes		Average Salary Increase		IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity	
Actual 1994	Projected 1995	Actual 1994	Projected 1995			Women	Minorities
10% to 20%	10% to 20%	4% to 5%	4% to 5%	16% to 25%	7 to 10	41% to 60%	26% to 40%
0%	0%	4% to 5%	NA	6% to 10%	7 to 10	41% to 60%	26% to 40%
1% to 4%	5% to 9%	9% to 10%	9% to 10%	6% to 10%	11 to 15	61%+	9% to 15%
0%	5% to 9%	4% to 5%	4% to 5%	11% to 15%	7 to 10	41% to 60%	26% to 40%
0%	10% to 20%	4% to 5%	6% to 8%	11% to 15%	4 to 6	16% to 25%	4% to 8%
10% to 20%	10% to 20%	4% to 5%	4% to 5%	11% to 15%	4 to 6	26% to 40%	9% to 15%
0%	0%	6% to 8%	6% to 8%	6% to 10%	7 to 10	26% to 40%	26% to 40%
1% to 4%	5% to 9%	4% to 5%	4% to 5%	16% to 25%	15 to 20	26% to 40%	26% to 40%
5% to 9%	1% to 4%	6% to 8%	6% to 8%	6% to 10%	7 to 10	26% to 40%	26% to 40%
10%	15%	6% to 8%	9% to 10%	26% to 40%	11 to 15	16% to 25%	16% to 25%
0%	-1% to -4%	1% to 3%	1% to 3%	1% to 5%	20+	26% to 40%	4% to 8%
0%	5% to 9%	4% to 5%	4% to 5%	16% to 25%	7 to 10	16% to 25%	4% to 8%
20%+	20%+	NA	NA	NA	15 to 20	26% to 40%	16% to 25%
-20%+	10% to 20%	4% to 5%	4% to 5%	25%	7 to 10	16% to 25	9% to 15%

NA = Not available

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Rank	Company	Industry	Location	New IS hires in 1994
45.	AT&T Consumer Communications Services	Telecommunications & Utilities	Basking Ridge, N.J.	10
46.	Central Arizona College	Education & Government	Coolidge, Ariz.	2
47.	First Commerce Corp.	Financial & Professional Services	New Orleans, La.	20
48.	Lithonia Lighting, Inc.	Electrical, Electronic & Photographic Equipment	Conyers, Ga.	12
49.	Detroit Edison Co.	Telecommunications & Utilities	Detroit, Mich.	16
50.	The Dow Chemical Co.	Chemicals, Petroleum & Plastic Manufacturers	Midland, Mich.	30
51.	The Gillette Co.	Apparel, Jewelry & Consumer Products	Boston, Mass.	4
52.	Outboard Marine Corp.	Industrial, Farm & Transportation Equipment	Waukegan, Ill.	8
53.	Reynolds Metal Co.	Forest, Metal, Building & Glass Manufacturers	Richmond, Va.	20
54.	USG Corp.	Forest, Metal, Building & Glass Manufacturers	Chicago, Ill.	0
55.	Aetna Life Insurance Co.	Financial & Professional Services	Hartford, Conn.	118
56.	Bank of Boston Corp.	Financial & Professional Services	Boston, Mass.	141
57.	Baylor University	Education & Government	Waco, Texas	4
58.	Lone Star Gas Co.	Telecommunications & Utilities	Dallas, Texas	25

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ONE OF COMPUTERWORLD'S BEST PLACES TO WORK 1994

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100 BEST PLACES TO WORK

IS Staff Changes		Average Salary Increase		IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity	
Actual 1994	Projected 1995	Actual 1994	Projected 1995			Women	Minorities
1% to 4%	5% to 9%	4% to 5%	4% to 5%	6% to 10%	7 to 10	41% to 60%	26% to 40%
0%	10% to 20%	4% to 5%	NA	0%	15 to 20	41% to 60%	16% to 25%
5% to 9%	5% to 9%	4% to 5%	4% to 5%	6% to 10%	11 to 15	41% to 60%	16% to 25%
10% to 20%	5% to 9%	4% to 5%	6% to 8%	16% to 25%	7 to 10	41% to 60%	16% to 25%
5% to 9%	0%	4% to 5%	4% to 5%	11% to 15%	7 to 10	16% to 25%	16% to 25%
-5% to -9%	-1% to -4%	6% to 8%	6% to 8%	6% to 10%	7 to 10	26% to 40%	9% to 15%
1% to 4%	1% to 4%	4% to 5%	4% to 5%	16% to 25%	4 to 6	26% to 40%	9% to 15%
20%+	10% to 20%	4% to 5%	4% to 5%	6% to 10%	4 to 6	26% to 40%	9% to 15%
5% to 9%	5% to 9%	6% to 8%	6% to 8%	6% to 10%	4 to 6	26% to 40%	9% to 15%
0%	1% to 4%	4% to 5%	1% to 3%	16% to 25%	4 to 6	26% to 40%	16% to 25%
1% to 4%	1% to 4%	4% to 5%	4% to 5%	16% to 25%	1 to 3	41% to 60%	9% to 15%
1% to 4%	1% to 4%	4% to 5%	4% to 5%	NA	4 to 6	41% to 60%	9% to 15%
5% to 9%	5% to 9%	4% to 5%	4% to 5%	11% to 15%	7 to 10	41% to 60%	4% to 8%
5% to 9%	5% to 9%	4% to 5%	4% to 5%	6% to 10%	7 to 10	41% to 60%	16% to 25%

NA = Not available

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Rank	Company	Industry	Location	How IS hires in 1994
59	Northwestern Mutual Life Insurance Co.	Financial & Professional Services	Milwaukee, Wis.	31
60	Pepsico, Inc.	Food, Beverage & Tobacco	Purchase, N.Y.	8
61	Caterpillar, Inc.	Industrial, Farm & Transportation Equipment	Peoria, Ill.	50
62	Crown Central Petroleum Corp.	Chemicals, Petroleum & Plastic Manufacturers	Baltimore, Md.	4
63	Florida Atlantic University	Education & Government	Boca Raton, Fla.	1
64	Helene Curtis Industries, Inc.	Apparel, Jewelry & Consumer Products	Chicago, Ill.	17
65	Honeywell, Inc.	Electrical, Electronic & Photographic Equipment	Minneapolis, Minn.	25
66	National Steel Corp.	Forest, Metal, Building & Glass Manufacturers	Mishawaka, Ind.	4
67	New York Life Insurance Co.	Financial & Professional Services	New York, N.Y.	57
68	Nike, Inc.	Apparel, Jewelry & Consumer Products	Beaverton, Oregon	20
69	Owens-Corning Fiberglass Corp.	Forest, Metal, Building & Glass Manufacturers	Toledo, Ohio	12
70	Price Waterhouse	Financial & Professional Services	New York, N.Y.	800
71	Rohm and Haas Co.	Chemicals, Petroleum & Plastic Manufacturers	Philadelphia, Pa.	4
72	The Sherwin-Williams Co.	Chemicals, Petroleum & Plastic Manufacturers	Cleveland, Ohio	50

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IS Staff Changes		Average Salary Increase		IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity	
Actual 1994	Projected 1995	Actual 1994	Projected 1995			Women	Minorities
0%	0%	4% to 5%	4% to 5%	11% to 15%	7 to 10	41% to 60%	4% to 8%
-5% to -9%	0%	4% to 5%	4% to 5%	16% to 25%	4 to 6	41% to 60%	9% to 15%
0%	1% to 4%	4% to 5%	4% to 5%	6% to 10%	7 to 10	26% to 40%	4% to 8%
10% to 20%	10% to 20%	4% to 5%	4% to 5%	16% to 25%	7 to 10	26% to 40%	9% to 15%
NA	5% to 9%	4% to 5%	NA	6% to 10%	7 to 10	26% to 40%	26% to 40%
-1% to -4%	5% to 9%	4% to 5%	4% to 5%	16% to 25%	15 to 20	26% to 40%	26% to 40%
-1% to -4%	0%	4% to 5%	4% to 5%	6% to 10%	7 to 10	26% to 40%	9% to 15%
0%	5% to 9%	6% to 8%	6% to 8%	1% to 5%	15 to 20	26% to 40%	9% to 15%
1% to 4%	1% to 4%	4% to 5%	4% to 5%	11% to 15%	4 to 6	26% to 40%	16% to 25%
1% to 4%	5% to 9%	4% to 5%	4% to 5%	11% to 15%	4 to 6	26% to 40%	9% to 15%
-10% to -20%	-1% to -4%	4% to 5%	4% to 5%	1% to 5%	11 to 15	26% to 40%	9% to 15%
20%+	20%+	NA	NA	16% to 25%	7 to 10	26% to 40%	16% to 25%
0%	0%	4% to 5%	4% to 5%	1% to 5%	7 to 10	26% to 40%	9% to 15%
10% to 20%	5% to 9%	4% to 5%	4% to 5%	11% to 15%	11 to 15	16% to 25%	9% to 15%

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Rank	Company	Industry	Location	New IS hires in 1994
73	Warner Enterprises, Inc.	Transportation	Omaha, Neb.	8
74	Comerica, Inc.	Financial & Professional Services	Detroit, Mich.	55
75	General Public Utilities Corp.	Telecommunications & Utilities	Parsippany, N.J.	25
76	Ace Hardware Corp.	Wholesale & Retail	Oak Brook, Ill.	30
77	American Greetings Corp.	Printing & Publishing	Cleveland, Ohio	30
78	Chemical Banking Corp.	Financial & Professional Services	New York, N.Y.	50
79	Corning, Inc.	Forest, Metal, Building & Glass Manufacturers	Corning, N.Y.	5
80	Jostens, Inc.	Apparel, Jewelry & Consumer Products	Bloomington, Minn.	10
81	Public Service Electric & Gas Co.	Telecommunications & Utilities	Newark, N.J.	10
82	Rite-Aid Corp.	Wholesale & Retail	Harrisburg, Pa.	50
83	The Atchison, Topeka and Santa Fe Railway	Transportation	Topeka, Kan.	NA
84	Standard Commercial Corp.	Food, Beverage & Tobacco	Wilson, N.C.	4
85	Elmira College	Education & Government	Elmira, N.Y.	0
86	Loctite Corp.	Chemicals, Petroleum & Plastic Manufacturers	Hartford, Conn.	2

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IS Staff Changes		Average Salary Increase		IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity	
Actual 1994	Projected 1995	Actual 1994	Projected 1995			Women	Minorities
10% to 20%	10% to 20%	6% to 8%	6% to 8%	1% to 5%	7 to 10	26% to 40%	4% to 8%
0%	0%	4% to 5%	4% to 5%	16% to 25%	7 to 10	41% to 60%	16% to 25%
-10% to -20%	0%	4% to 5%	4% to 5%	6% to 10%	4 to 6	41% to 60%	16% to 25%
10% to 20%	5% to 9%	6% to 8%	6% to 8%	11% to 15%	7 to 10	26% to 40%	4% to 8%
0%	0%	4% to 5%	4% to 5%	6% to 10%	4 to 6	26% to 40%	9% to 15%
0%	0%	4% to 5%	4% to 5%	6% to 10%	11 to 15	26% to 40%	NA
-5% to -9%	-5% to -9%	4% to 5%	4% to 5%	6% to 10%	7 to 10	26% to 40%	4% to 8%
-1% to -4%	1% to 4%	4% to 5%	4% to 5%	NA	20+	26% to 40%	1% to 3%
-5% to -9%	10% to 20%	1% to 3%	1% to 3%	6% to 10%	7 to 10	16% to 25%	9% to 15%
10% to 20%	10% to 20%	4% to 5%	4% to 5%	1% to 5%	7 to 10	16% to 25%	4% to 8%
-5% to -9%	0%	1% to 3%	1% to 3%	1% to 5%	7 to 10	16% to 25%	4% to 8%
0%	10% to 20%	6% to 8%	6% to 8%	NA	4 to 6	26% to 40%	9% to 15%
0%	10% to 20%	9% to 10%	6% to 8%	16% to 25%	20+	41% to 60%	0%
1% to 4%	10% to 20%	4% to 5%	4% to 5%	15% to 25%	4 to 6	41% to 60%	9% to 15%

NA = Not available

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- NT, SDK, MFC
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- VC++, Kernel level exp.
- Windows, DLL's, MS-Tool
- NT Porting, Sun, C++
- C++, Windows, XVT
- Real-Time embedded S/W, 68HC11 or 68302
- C++, Device Drivers
- MAC, Sys 7
- UNIX System Admin.
- Progress V.7, UNIX
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S E E K C O N S U L T I N G

Rank	Company	Industry	Location	New IS hires in 1994
87	North Carolina Central University	Education & Government	Durham, N.C.	1
88	U.S. Department of Labor	Education & Government	Washington D.C.	3
89	University of West Florida	Education & Government	Pensacola, Fla.	3
90	International Paper Co.	Forest, Metal, Building & Glass Manufacturers	Memphis, Tenn.	30
91	The Library of Congress	Education & Government	Washington D.C.	0%
92	PECO Energy Co.	Telecommunications & Utilities	Philadelphia, Pa.	NA
93	University of Wisconsin-Stevens Point	Education & Government	Stevenspoint, Wisconsin	3
94	Occidental Petroleum Corp.	Chemicals, Petroleum & Plastic Manufacturers	Los Angeles Calif.	4
95	Deere & Co.	Industrial, Farm & Transportation Equipment	Moline, Ill.	8
96	University of Southern California	Education & Government	Los Angeles, Calif.	10
97	U.S. Securities and Exchange Commission	Education & Government	Washington, D.C.	10
98	The Kroger Co.	Wholesale & Retail	Cincinnati, Ohio	22
99	U.S. Environmental Protection Agency	Education & Government	Washington D.C.	0
100	Campbell Soup Co.	Food, Beverage & Tobacco	Camden, N.J.	NA

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100 BEST PLACES TO WORK

IS Staff Changes		Average Salary Increase		IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity	
Actual 1994	Projected 1995	Actual 1994	Projected 1995			Women	Minorities
20%+	5% to 9%	1% to 3%	1% to 3%	6% to 10%	7 to 10	41% to 60%	26% to 40%
-5% to -9%	-5% to -9%	1% to 3%	1% to 3%	1% to 5%	4 to 6	41% to 60%	16% to 25%
1% to 4%	5% to 9%	4% to 5%	NA	6% to 10%	4 to 6	41% to 60%	9% to 15%
0%	0%	1% to 3%	1% to 3%	6% to 10%	4 to 6	26% to 40%	9% to 15%
-1% to -4%	5% to 9%	6% to 8%	6% to 8%	6% to 10%	7 to 10	26% to 40%	26% to 40%
-20%+	0%	1% to 3%	1% to 3%	NA	NA	16% to 25%	4% to 8%
5% to 9%	5% to 9%	6% to 8%	1% to 3%	11% to 15%	11 to 15	16% to 25%	0
5% to 9%	0%	4% to 5%	4% to 5%	1% to 5%	4 to 6	41% to 60%	16% to 25%
-1% to -4%	-1% to -4%	4% to 5%	4% to 5%	6% to 10%	7 to 10	16% to 25%	1% to 3%
0%	0%	4% to 5%	4% to 5%	1% to 5%	0	26% to 40%	16% to 25%
0%	1% to 4%	1% to 3%	1% to 3%	1% to 5%	1 to 3	41% to 60%	16% to 25%
1% to 4%	5% to 9%	1% to 3%	1% to 3%	6% to 10%	7 to 10	41% to 60%	4% to 8%
-5% to -9%	0%	1% to 3%	1% to 3%	1% to 5%	7 to 10	41% to 60%	16% to 25%
0%	1% to 4%	NA	NA	11% to 15%	20+	41% to 60%	NA

NA = Not available

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INDUSTRY *by* INDUSTRY

Each industry has its own signature when it comes to how it rewards its IS professionals. Below is a summary of the vital statistics for the 15 industry segments that comprise The *Computerworld* Best Places to Work company list. Figures ara based on averages for each industry segment. For a list of the companies by industry, refer to the listing on page 6. For a ranking of the 100 companies, refer to the tables starting on page 70.

Industry	Avg. new 1994 IS Employees	Avg. IS Staff Changes 1994 Actual	Avg. IS Staff Changes 1995 Projected	Average Salary Increase 1994 Actual	Average Salary Increase 1995 Projected	IS Staff Promoted in 1994	Days of Training in 1994	IS Staff Diversity Women	IS Staff Diversity Minorities
Apparel, jewelry and consumer products	26	4%	6%	5%	5%	15%	10	37%	15%
Chemicals, petroleum and plastic manufacturers	15	5%	5%	5%	5%	13%	8	34%	12%
Computer hardware, software and office equipment	227	10%	12%	6%	6%	14%	11	37%	23%
Construction and real estate (Only one company in this category)	1	-20%	15%	5%	5%	25%	5	21%	12%
Education and government	3	3%	6%	5%	4%	9%	10	43%	21%
Electrical, electronic and photographic equipment	19	3%	5%	4%	5%	11%	11	34%	11%
Financial and professional services	157	6%	7%	5%	5%	15%	10	45%	15%
Food, beverage and tobacco	4	-2%	5%	5%	5%	17%	10	45%	12%
Forest, metal, building and glass manufacturers	35	3%	4%	5%	5%	11%	11	33%	16%
Industrial, farm and transportation equipment	19	8%	5%	5%	5%	11%	7	34%	8%
Pharmaceuticals and healthcare	70	15%	11%	5%	5%	17%	5	42%	9%
Printing and publishing	25	-1%	1%	5%	5%	5%	7	42%	31%
Telecommunications and utilities	48	-3%	5%	4%	4%	12%	10	37%	21%
Transportation	20	4%	7%	5%	5%	10%	12	34%	16%
Wholesale and retail	232	13%	12%	5%	5%	15%	5	38%	12%

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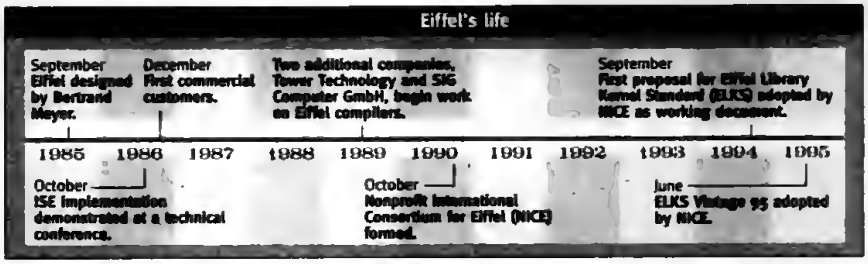


Eiffel community rallies

Object-oriented language ramps up its products and standards

By Elizabeth Heichler

Developers working with object-oriented languages have another contender for their attention. The newcomer is the relatively young Eiffel language, which is looking to steal some limelight from dominant players C++ and Smalltalk.

At Object Expo in New York earlier this month, Eiffel users were pleased to hear that vendors have agreed on a standard that will ensure that software applications developed with different vendors' Eiffel tools will interoperate.

> The Eiffel object-oriented programming language was developed to be a formal specification language for reusable software components. Newer implementations of Eiffel produce code that is interoperable with C++.

Incompatibilities among different vendors' Smalltalk or C++ compilers make it difficult to reuse code outside the environment in which it was created. But Eiffel users will be able to reuse code and libraries created with one vendor's tools in another vendor's environment.

The new standard, the Eiffel Library Kernel Standard (ELKS), was just released by the Nonprofit International Consortium for Eiffel (NICE). It is expected to spur the growth of a third-party market in reusable software components for Eiffel, according to Robert Howard, president and chief executive officer of Eiffel compiler vendor Tower Technology Corp. in Austin, Texas.

For example, both Tower and Interactive Software Engineering, Inc. (ISE) in Santa Barbara, Calif., will release versions of their Eiffel compilers that fully support the new standard by year's end.

Representatives of the consortium said Rational Software Corp. in Santa Clara, Calif., will release later this year a version of its Rational Rose software development tool that supports Eiffel. A Rational spokeswoman confirmed that the company has had discussions with members of the Eiffel community but has not yet officially announced product support for Eiffel.

Users welcomed the Eiffel standard library. It will give them more freedom to use products from different vendors instead of being tied to one compiler vendor because the code they have written works only with that vendor's tools.

"This is nice because we can now put more pressure on vendors," said Richard Bielak, a developer at Credit Agricole-Lazard Financial Products Ltd. (CALfp) in New York. The standard will give him more leverage in vendor negotiations because he will not be locked in to one Eiffel vendor's products, he explained.

Although Eiffel is relatively obscure compared with C++ and Smalltalk, its shorter history means that different implementations have had less opportunity to diverge. So it was easier to reach agreement on a standard, said Bertrand Meyer, author of the language.

Different strokes for different folks

At WSC Investment Services, Inc. in New York, Eiffel is being used for "heavy-duty back-office processing" applications, said Paul Murphy, director of advanced technology. Smalltalk does not offer sufficiently high performance or scalability, he said, while C++ poses too many maintenance problems for large-scale projects. Unlike C++, Eiffel does not produce bugs in memory management, which is the area with the most insidious bugs, Murphy said.

"We're happy about the standard because we're trying to make everything portable between Tower and ISE," Murphy said.

NDC Systems in Monrovia, Calif., also considered Smalltalk and C++ before it chose Eiffel for developing real-time process control systems, according to software manager Don Erway.

Among Eiffel's strong points are the ability of its compiler to check the correctness of arguments and provide the developer with information that eliminates "all possible stupid errors," he said.

Sketchy plans, politics stall software development

By Julia King

Inadequate user involvement, too little up-front planning and petty politics will sabotage thousands of software development projects this year, costing U.S. companies and government agencies a total of $81 billion.

Of those projects that large companies complete — 31% will never see the light of day — only about 9% will come in on time and on budget. But in their final form, these applications will be a lot skimpier than initially conceived, containing only 42% of the originally proposed features and functions.

Even more alarming than the vast number of projects that fail are the reasons for the failures, which are the same over and over again. This is because most information systems managers are unwilling to examine what went wrong in any kind of systematic way, according to Jim Johnson, chairman of The Standish Group International, Inc.

These are a few of the more sobering statistics gathered by the Dennis, Mass.-based market research firm that interviewed 365 IS executives for "Chaos," its recently published report on the current state of software development in the U.S.

Johnson homed in on IS's attitude while speaking to a group of project managers who convened in Chicago earlier this month. "When a bridge falls down, it is investigated and a report is written on the cause of the failure," he said.

But not so in the computer industry, Johnson said. "There, failures are covered up, ignored and/or rationalized. As a result, we keep making the same mistakes over and over again."

Yet more often than not, those mistakes have nothing to do with technology or managers' technical acumen. Instead, political squabbles, runaway user expectations and inadequate support from upper management are to blame.

Consider the case at Eagle Window & Door, Inc., a $45 million manufacturer in in Dubuque, Iowa.

In July 1993, the company purchased Andersen Consulting's Macpac software, which it planned to implement on an IBM AS/400 platform. But almost two years later, the new system has yet to be rolled out, largely due to infighting, according to Jason Schroeder, the project's manager.

"We had some people in upper management positions who didn't support the project at all, and some even tried to bring it down," Schroeder recalled.

"What snowballed from that is that users didn't want to get involved if top management wasn't supporting the project," he added.

Now, the company has replaced about 50% of its top managers, and Schroeder said he expects to implement the system's accounts receivable and order processing modules later this summer.

At Lutheran Medical Center in Denver, it was the absence of a clear plan and finish date that threatened to throw off deployment of a human resources/payroll system, according to Kathryn Bingman, former chief information officer.

Again, technology was not the problem.

"We had a bunch of cowboys out on their own. We were 18 months into the project, and it had an ever-expanding scope and no deadlines," Bingman said.

To turn things around, Bingman brought in a new project manager, who corralled the runaway project by forming a team of eight IS staffers and 14 users. Together, they staked out very well-defined boundaries and then kept developers and users within them.

In the end, the system was delivered three weeks later than originally scheduled, but the postponement was initiated by users, not IS, Bingman said.

Top 10 reasons software projects fail:

1. Incomplete requirements
2. Lack of user involvement
3. Lack of resources
4. Unrealistic expectations
5. Lack of executive support
6. Changing requirements and specifications
7. Lack of planning
8. Software no longer needed
9. Lack of information technology management
10. Technology illiteracy

Source: The Standish Group International, Inc., Dennis, Mass.

Pentagon EIS connects data pieces

By Gary H. Anthes
FALLS CHURCH, VA

Three years ago, management analysts in the Office of the Secretary of Defense could best be described as analytically challenged. Although their jobs were information-intensive, their data sources were fragmented, untimely and difficult to integrate and manipulate.

Now, thanks to an executive information system (EIS) built using rapid prototyping tools, it is all point and click for the Pentagon planners.

"A senior official [in the Secretary of Defense's office] said, 'Gee, I think we need to get our hands around information faster and better, instead of getting all these batch reports,'" said John E. Roby, director of EIS design and development at the Defense Acquisition and Technology Data Center (DATDC) here.

To do that, Roby, his staff and a local contractor built a system that is both a front-end data collector for the batch systems and an analytical engine for end users.

Developed using Pilot Software, Inc.'s LightShip Suite and Oracle Corp. databases, the EIS integrates and puts on-line 2G bytes of information about military bases, supplies, transportation, maintenance and other topics. It searches, cross-references, summarizes and displays data from any of 150 tables in a variety of graphical formats.

Clay Robinson, director of customer support at the DATDC, clicked on a map of the world, then on the U.S., then on South Carolina, then on the Charlestun Naval Shipyard and finally on a building there to learn when it was built, its size, replacement cost and so forth. He could have easily asked to see all facilities built before 1960 with a replacement cost more than $10 million.

DATDC's Clay Robinson and John Roby *use the EIS to integrate information about military bases, supplies and other topics*

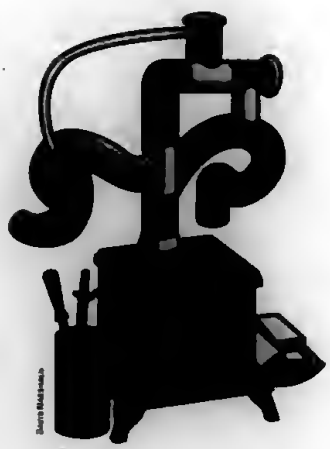
Using only a mouse, Robinson sliced and diced billions of dollars of defense assets with apparent ease. "I don't know SQL, and I don't want to know SQL," he bragged. "And policy makers shouldn't have to know SQL either."

Indeed, the 140 policy analysts who use the EIS can build their own screens and inquiries using Insight, a tool developed using LightShip. It allows end users to define their own screens and analyses by clicking on data elements, time horizons, mathematical operations and output formats.

"The biggest benefit to the EIS is now I always know where my data is," said a supply analyst who asked not to be named. Previously, he had to pore through stacks of paper and call people on the telephone to find the data he needed.

Robinson said a key constraint in building the EIS was that the development team could not make changes to the feeder systems. In most cases, the only changes made were to replace paper reports with the same reports on tape or disk for input to the EIS. In a few cases, the DATDC must still manually key data into the EIS from paper.

Roby said the hardest part of building the EIS was getting buy-in from the disparate sources who had to provide data.



Before the Office of the Secretary of Defense implemented its new EIS, data was fragmented. Stovepipe systems from more than 50 supply, logistics, transportation and acquisition offices around the Defense Department and elsewhere produced stacks of paper. This data flowed into the department in incompatible formats and coding structures. Doing an analysis to support a military base closure could require a tedious and error-prone compilation of data from many sources for input into a spreadsheet.

Briefs

CSA, Solaris hook up

Computer Systems Advisers, Inc. in Woodcliff Lake, N.J., said it has ported its Silverrun upperCASE modeling tool to Sun Microsystems, Inc.'s Solaris 2.4 for use with Intel Corp. X86 or Sun SPARC machines. CSA said the Solaris version will ship this month for $3,500.

DCE for Mac developed

Gradient Technologies, Inc. in Marlboro, Mass., is teaming up with the University of Michigan to develop a client version of the Open Software Foundation's Distributed Computing Environment (DCE) for Macintoshes. Apple Computer, Inc. has remained on the DCE sidelines, much to the consternation of customers like the university, which has 15,000 Macintoshes and was one of the first organizations to commit to DCE.

OpenDoc backers rally

Just in case anyone doubts the commitment of Novell, Inc. to the OpenDoc component software architecture, Bob Frankenburg, chief executive officer and president, was scheduled to join Apple CEO and President Michael Spindler and IBM Senior Vice President John Thompson in a show of unity at PC Expo in New York this week. The executives were slated to argue that OpenDoc, in contrast to rival OLE technology from Microsoft Corp., will simplify applications interoperability in multiplatform environments.

Taligent to deliver tool

The first release of Taligent, Inc.'s CommonPoint application development tool will be delivered to investors IBM, Apple Computer, Inc. and Hewlett-Packard Co. this month, Cupertino, Calif.-based Taligent said earlier this month. At Object Expo in New York, IBM said it will be the first to bring the framework technology to market when it ships the CommonPoint Application System for AIX and a development tool kit for AIX. The tools are scheduled for availability July 28. Taligent Chairman and CEO Joseph Guglielmi said versions for OS/2 and OS/400 are in the works and a version for Microsoft Corp.'s Windows NT and Windows 95 will be on the market by mid-1996.

[redacted]

SQA, Inc. has announced SQA Enterprise Solution for PowerBuilder, a suite of tools for testing applications built with Powersoft Corp.'s PowerBuilder.

According to the Woburn, Mass., company, SQA Enterprise Solution for PowerBuilder offers object-level support for PowerBuilder and tests the contents of any PowerBuilder object. It can test an object's DataWindows, composite DataWindows and DropDown controls, which can verify the details of DataWindows' interaction with SQL databases. It also has enhanced Object-Oriented Recoding technology that records PowerBuilder objects within a DataWindow.

SQA Enterprise Solution for PowerBuilder directly reads PowerBuilder libraries to automatically generate test requirements and test procedure names. It also features client/server load testing, electronic-mail-enabled workflow testing and an integrated programming environment. SQA TeamTest is one of the first testing products to integrate with Version 2.0 of the Powersoft testing application programming interface.

Pricing for SQA Solution for PowerBuilder starts at $3,495 for a single user. Multiuser licenses are also available.

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NetSoft has introduced ClientLink, a tool kit for IBM mainframe and midrange systems and other host servers.

ClientLink was designed to help IBM's CICS and Messaging and Queuing Series (MQSeries) customers. According to the Irvine, Calif., firm, ClientLink helps Visual Basic and PowerBuilder developers transform the CICS system from a 3270 applications platform into a database server using the CICS transaction model.

By adding a ClientLink Custom Control to the Visual Basic Toolbox, applications can interface with CICS or exchange MQSeries messages using standard Visual Basic properties.

For MQSeries customers, it lets Visual Basic or PowerBuilder developers create applications that communicate with other corporate platforms supporting MQSeries. ClientLink has a Windows interface to MQSeries and can function in both client and server mode.

Prices for single-user versions of ClientLink start at $195. Multiuser pricing is available.

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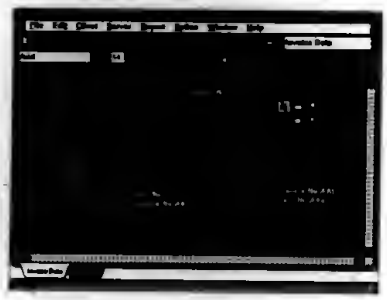

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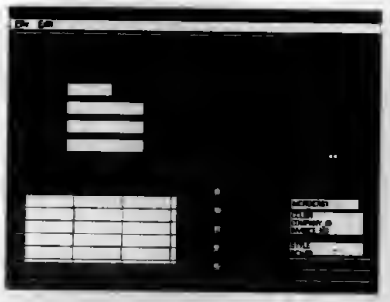

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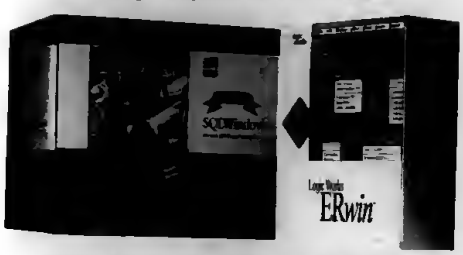

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STRESSED TO

Watch out! Every project has stress points that can wreck your relationship with end-user sponsors — unless you know how to predict and avoid them

By Alice LaPlante

Two years ago, when he was prototyping an application, Marty Faulkner and his relationship with the application's sponsor received a strong jolt.

"We'd actually done our job too well. it got us in trouble," recalls Faulkner, manager of project management at the California State Automobile Association (CSAA) in San Francisco. Indeed, the simulation of what the final application would look like was so impressive that the sponsors got greedy — they wanted it too soon.

"They couldn't understand why we still needed several more months — and the rest of the allocated budget — to complete the project," Faulkner says.

The project was completed, and the sponsor was ultimately delighted. But Faulkner says he's now much more cautious about putting too much glitz into a prototype for fear this could happen again.

Other information systems project managers have similar stories. Their accumulated experiences bring to light a series of potential pitfalls — such as the first glimpse of a prototype — in which the IS/sponsor relationship is put to the test.

"There are a number of discrete times in a project where the IS team and the users must come into alignment," says Erwin Martinez, a partner with CSC Consulting in San Francisco. "Unfortunately, a number of things can go horribly awry as you attempt to negotiate your way past these stress points."

These stress points — and ways to deal with them — follow.

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Marty Faulkner, *manager of project management at the CSAA, says he's cautious about putting too much glitz into a prototype for fear that the sponsor will want it too soon*

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STRESSED TO

CONTINUED FROM PAGE 87

1. Initial project definition

Problem: Vague or ill-defined goals, unrealistic expectations
Solution: Make sure users set realistic goals

Tho first encounter with sponsors can be fraught with danger.

When business managers or users call on IS for help with a particular problem, rarely are they able to clearly explain the business issue or goal behind their request. Sometimes users don't really understand what the goals are.

That, coupled with "rather unrealistic ideas about how that problem is going to be solved using technology, puts IS in a peculiar position," says Joe Kolinger, technical director at Pacific Bell in San Francisco.

At this initial encounter, it is critical that IS help users arrive at realistic goals and expectations without being seen as a killjoy or even hostile to the users' needs.

"IS must tread very cautiously, perhaps pointing out that it might not make sense to invest too much time and effort in continuing with the project until the underlying business problem is better defined," Kolinger says. "But this is not something your users want to hear."

There is an abundance of external consultants and outsourcing specialists willing to promise a quick fix for a department's problem. This puts even more pressure on IS to guide users toward appropriate action.

"It's important to come across as realistic, not defensive," says Patrick McGuinness, director of information technology at Domecq Importers, Inc., a liquor importer based in Old Greenwich, Conn.

2. Determining timetables, budgets and participants

Problem: Setting guidelines too early, leaving out key users
Solution: Resist user pressure, make sure all parties are involved

The biggest problem with this second encounter is that sponsors typically want to do this too soon in the early discussion period, even before the basic requirements are agreed upon.

"All too often, a sponsor wants a too-early commitment from IS about schedules. And out of insecurity or anxiety to please, we give one prematurely," Kolinger says. Giving in to this pressure "nearly always backfires," he says.

Another critical problem that can arise at this point is the discovery that certain key user stakeholders have been left out of project discussions.

"When it comes time to allocate funds, you can realize there are certain users that should have a say in what you're doing, yet you've failed to include them in prior project talks," Martinez says. If this happens, the damage can be difficult, if not impossible, to repair.

"It's unfortunately a very human reaction for people to get angry, perhaps even reject the proposal as ill-conceived," Martinez says. "Their argument is, 'If you were really serious about this project, you would have tried harder to find out who would be affected.'"

3. Requirement analysis

Problem: User frustration and impatience, larger organizational problems
Solution: Offer opportunities for adding functionality later on

Beware of increasing user frustration during the critical preceding requirements analysis, the phase of a project when the team decides what exactly it is trying to do. After all, most current project management methodologies call for putting more time and effort into upfront requirements analysis and design.

"Suddenly, the user must submit to such things as extensive 'needs' interviews, facilitated design sessions and document reviews," says Philip Fasone, president of Powersolv Corp., an application development consulting firm in Norcross, Ga. "After two months of this — without any sign of actual coding — your user often starts wondering if you are competent and whether you are ever going to get your application out."

At this stage, underlying organizational problems on the sponsor's end can become visible. For example, vague or inconsistent sponsor input during the requirement analysis can indicate that the users' business problems go deeper than those the project addresses, says Mike Lamble, vice president of First Chicago Bank in Chicago.

"If by this point I can't get a clear answer to 'what is this system supposed to do?' in 30 words or less, I know the sponsor is in some sort of trouble," Lamble says. In that case, Lamble will often look into the history of other recent projects, technology-related and otherwise, for that corporate department or function.

"If you discover there's historically been a lot of shifting of priorities, confusion about goals and swings in project scope, that's a significant red flag," Lamble says. And don't proceed until you've analyzed the cause of the users' habitual confusion, Lamble advises.

On the other end of the spectrum, some users insist on prolonging the requirement analysis phase in order to define a project that encompasses *all* their goals.

At Mervyn's, a Hayward, Calif.-based retail chain, the IS department has hammered out the "80% solution" with its users to avoid this problem, says Mary McCormick, MIS director of planning and technology. Under the "80% solution," IS and users have agreed that if other things arise, they can be put into the next release of the application.

Stressed to kill, *page 92*

Eliminate stress with communication

ASK BUSINESS SPONSORS about the "stress points" that inevitably arise during an IS development project and they'll agree that anticipating and surmounting these challenges takes constant vigilance.

Yolanda Manuel, manager of sales and member services projects at the CSAA, says she has learned to be particularly cautious when viewing actual screens or early prototypes of a new application for the first time.

"There are always those times when the programmers have designed something they're really proud of, and for some reason — perhaps we didn't make our requirements clear or perhaps they simply didn't understand them — we'll have a problem with what we see," Manuel says. After breaking the news that things are not satisfactory, "it becomes a question of getting everyone in the same room and hammering out a solution."

It may be the sponsor's fault, Manuel says. "We have blinders on about what technology can and can't accomplish," she says. "Sometimes those aren't exposed until we see a working prototype."

But IS makes its share of mistakes, and "there are times when we can't just let something go — not when something they've done will create havoc for 8,000 users," Manuel says.

What's the solution to getting past such stress points? "Communication and education on both sides," she says.

At Pacific Bell, a formal IS project development methodology put in place three years ago dictates that the sponsors take the first crack at defining the IS project specifications, says Jim Ingwalson, director of wireless services at the regional Bell operating company.

But even after new IS projects are submitted to systems experts for review and sent to a management committee that approves funding and schedules, "the sponsor will inevitably want changes that must be accommodated after project development is under way," he says.

Getting over this hurdle of asking for additional features or functionality can be quite grueling, Ingwalson says. Significant changes to the project's scope or specifications must be approved by the project management review board. Approval will depend on budgets, time frames and the priorities of other IS projects under development. There's no way to circumvent what can be an arduous chain of command.

On the bright side, having a formal process for prioritizing additional sponsor requests has "really improved our relationship with IS," Ingwalson says. "Now we have a way of coming together and talking about the issues under more objective circumstances."

— Alice LaPlante

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4. That first look

Problem: Assumption by user that early design is final
Solution: Stress that early design can be changed, welcome negative feedback

Even with extensive user involvement in the analysis and design, even if all required sign-offs and formal approval checkpoints have been cleared, the point at which users actually *see* a working prototype is critical.

First, there's the common misunderstanding that an early screen or interface design is written in atone. This can result in disappointed or irate users who must be soothed into providing essential suggestions and criticisms.

The solution: extreme patience. Calmly assure users that they're looking at a prototype and not a final product. Then take the time to educate users that even an unfavorable reaction to the prototype is a valuable one that can point the way toward a solution. And forget about depending on formal sign-offs to eliminate this type of confrontation.

"It's possible that many of your approval signatures aren't worth the paper they're printed on," Kolinger says. "Users typically have too mueb going on to pay sufficient attention to every aspect of an ongoing project."

Martin Hodgkinson, vice president and director of tS at the Ontario Cancer Treatment and Research Foundation in Toronto, says he gets the most worried if, prior to his unveiling a prototype, "the user community bas grown quiet and calls haven't been returned."

"It'u inevitable that the more the user is forced to think about the issues in a concrete way, the more suggestions they will come op with," he says. There is oo cure for this if it occurs, only prevention, Hodgkinson adds. Get as many user concerns on the table as early in the project as possible, he says. And make sure you can get your sponsor's undivided attention.

5. Milestone meetings

Problem: Users may ask for more than initial project design
Solution: Have a good change management process in place

Once coding is under way, eveo routine status meetings between tS and sponsors are full of potential pitfalls.

It is duriog such run-of-the-mill status npdates that almost inevitably problems with "scope creep" arise. This is the chaos that ensues when users begin asking for additionat features or funetionality not included tn the original project plan. Woe to tbe tS project leader who doesn't have a strong change-management process already outlined that can prioritize these requests and determine which are possibte without destroying agreed-upon budgets and schedutes.

After all, Martinez says, "a business manager who bas invested $2 million in an tS project tends to think of it as an extraordinarily obscene amount of money. tt's not, these days, but the perception is there. Such managers therefore feel entitled to ask for anything they want wheoever it occurs to them," Martinez says.

Indeed, what Hodgkinson says he fears most is "when the user suddenly sits up and asks, 'Why doesn't it do *this*?' " What they're asking for might be an obvious next step, "but it wasn't part nf the project," he says.

"You must kitl this monster early or it will continue to grow," Martinez says.

6. Testing

Problem: Any problems can make users nervous
Solution: Tell users what to expect at eacb phase of the project

The reasoo for testing is to find out whether something works — period. Naturally, you hope you've put enough quatity safeguards into place so errors caught during prototyping or testing are kept to a minimnm.

But keep in mind that users may get spooked if *any* problems arise rather than consider the testing to be part of an overalt scheme for developing a high-quality application.

"Users are getting more technically savvy, but you still run the risk of scaring them," McGuinness says about the potential for system crashes and blowups during the testing stage.

McGuinness says he will keep an application under wraps for an extra week or so if there's any chance that something might crash in front of a nervous sponsor. This way, a fix can be put in place before the sponsor sees the applications. Beyond that, it's critical to continually temper user expectations as to what to expect at eacb stage of application development, according to McGoinness.

"One of the advantages of working very closely with your users throoghout a project is to educate them on the complexities of technology development," McGuinness says. "Talk their language. Understand their concernu. But also teach them a iittle about your world." It'u especially important to reiterate the lessons tearned just prior to final testing, when the close proximity to implementation can make even minor problems seem ominous, he says. ■

LaPlante Is a freelance writer in Woodside, Calif.

Intelligence Files

Did IS fuel the economic miracle in the Pacific Rim?

ECONOMIC GROWTH and information systems investment grew simultaneously in the fast-growing Asia/Pacific region. What's the connection? That's the question Kenneth L. Kraemer and Jasoo Dedrick of tbe University of California at Irvine are trying to answer.

Kraemer and Dedrick have compared technology investments among t2 Pacific Rim countries from 1984 to 1990 in their study, "Payoffs from Investment in Information Technology: Lessons from tbe Asia-Pacific Region." The study concludes that countries witb bigher growth rates in tS investments achieved consistently bigher growth rates of gross domestic products and productivity.

Do their findings challenge the so-called "productivity paradox" — the claim that investmeots in technology have not paid off in productivity improvements? Did tS investments help bring about economic growth in the region? The authors say their initial findings "show a strong correlation between growth in [information technology] investment and productivity in national economics." They have since gathered more data, and according to Kraemer, will spend the summer working on an article that establishes a cause and effect link between the two. — *David B. Weldon*

FRUITS OF THEIR INVESTMENTS

Pacific Rim countries with the highest economic growth rates from 1984 to 1990 also had the highest tS investment growth rates

Country	Productivity growth	Growth in tS investment
South Korea	24%	25%
Taiwan	23%	23%
Hong Kong	19%	17%
Singapore	18%	18%
India	17%	23%
Thailand	15%	25%
Japan	15%	15%
Malaysia	14%	11%
Indonesia	10%	18%
Australia/New Zealand	6%	16%
Philippines	0%	13%

Source: Kenneth L. Kraemer and Jason Dedrick of the University of California, Irvine

State IS execs group picks top systems

The National Association of State Information Resource Executives (NASIRE) in Louisville, Ky., has announced the 15 winners of its annual recognition awards for outstanding IS achievements. Among this year's winners are initiatives in health care, Medicare, welfare and access to government records.

Texas earned five of the 15 awards, including one for the Lone-Star electronic benefits transfer (EBT) system developed for the Department of Human Services. The largest EBT system in the country, it will eventually process more than $2 billion in food stamps provided to 1 million households annually as well as $600 million in Aid to Families with Dependent Children benefits. The new system has dramatically streamlined and reduced the administrative costs of processing assistance claims.

The Massachusetts Office of Management Information Services was honored for its Massachusetts Access to Government Network (MAGNet). MAGNet is a statewide, high-speed communications infrastructure developed to bolster the state's economic health. Linking 7,500 state and municipal employees, 2,500 library PCs and potentially 300,000 businesses, it will eventually support electronic tax filing, automobile registration renewal, welfare application filing and case assistance, electronic benefits/payment transfer and public information dissemination.

Client/server technology awards went to the **Indiana AIM (automated information management) System**, used by the Office of Medicaid Policy and Planning to process Medicaid claims, and the **Texas Regulatory and Compliance System** at the Texas Natural Resources Conservation Commission, osed in natural resource protection and planning.

Other winners included the following:

- **Arkansas Department of Human Services:** Automated Eligibility Verification & Claims Submission system.
- **Delaware Division of Revenue:** Business System Master Plan Initiative and the Kentucky Labor Cabinet Imaging System.
- **Maryland Department of General Services:** Fiber Optic Resource Sharing Project.
- **Pennsylvania Office of Administration:** Rural Health Telecommunications Network.

— *David B. Weldon*

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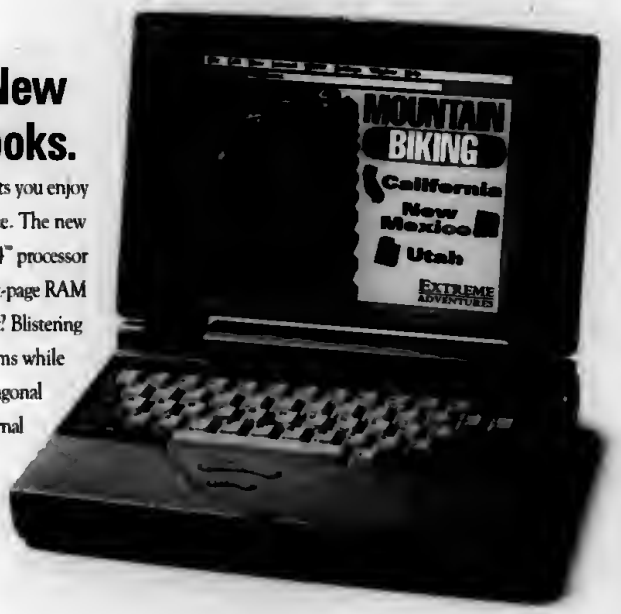

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4

WHAT TO DO IF YOU'VE GOT ALL THE INFORMATION IN THE WORLD.

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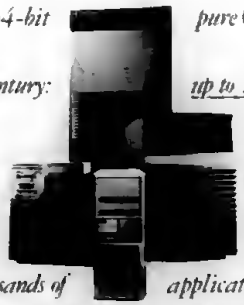

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AA-0

Calendar

JULY 13 - JULY 21

MANAGEMENT

Reshaping Information Systems: The New IS Mission/The Keys to a World Class Enterprise. Chicago, July 13-14 — Sessions will include the following: "IT Industry and Technology Futures," "IT Management Trends," "IT Economics and Value Generation," "Advanced Technology and Architecture Trends," "IT Asset and Portfolio Management," "IT Organization and Skill Management" and "External Services Provider Management." Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (203) 967-6757.

Business Process Re-engineering: Methodologies, Business Process Modeling and Analysis Techniques for the Project Team. Stamford, Conn., July 17-19 — Focus is on understanding and managing the steps, deliverables and techniques for implementing and supporting the phases of a business process re-engineering initiative. This course provides practical experiences through exercises, documenting and mapping the "as is" business process, establishing baseline measurements, creating the "should be" business processes and managing changes. Contact: Pierson Applications Development, Inc., Stamford, Conn. (203) 322-1606.

IS Financial Benchmarking and Peer Analysis. San Diego, July 19-21 — Seminars will include "Data Requirements: Keys to Successful Benchmarking," "Methodologies and Tools: Maximizing the Efficiency of Benchmarking" and "Peer Relationships: Keys to Effective Benchmarking Relationships." Fee: $395 for Financial Management for Data Processing (FMDP) members, $495 for nonmembers. Contact: FMDP, San Francisco, Calif. (415) 731-3706.

USER GROUPS

Second Annual Southern California Technical Conference for Midrange Computer Professionals. Costa Mesa, Calif., July 20-21 — Sponsored by the Ocean User Group of AS/400 users. Fee: $325. Contact: Ocean User Group, Corona Del Mar, Calif. (714) 751-5100.

TECHNOLOGIES

Technology Commercialization and Economic Growth Conference. Washington, July 16-19 — Sponsored by the Technology Transfer Society and the Association of Federal Technology Transfer Executives. Contact: Technology Transfer Society Information, Burke, Va. (317) 262-5022.

Summer '95 Conference and Solutions Fair. Boston, July 16-20 — Theme: "Discovering Springboards to Open Systems — IT Management Across Platforms." Topics will include data security, client/server, LANs, information technology management, industry applications, languages and tools. Contact: Guide International Corp., Chicago, Ill. (312) 245-6610.

All About IRM '95. Beaver Creek, Colo., July 17-19 — Topics will include implementing information resource management (IRM) with object-oriented systems, unlocking the hidden assets in the organization and data warehouse project assessment. Fees: $1,095 per person, $850 per person for three or more from the same organization, $750 per participant for 10 or more. Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

INDUSTRIES

The 4th Annual Computer Event Marketing Association Summit. Coronado, Calif., July 12-14 — For individuals involved with or interested in computer events, trade shows, seminars, conferences, expositions and marketing communications. Contact: Danieh & O'Keefe Associates, Inc., Sudbury, Mass. (508) 443-3330.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO:

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BY LINDA MYERS-TIERNEY
Program Director for International Data Corp. (IDC)

Electronic Documents: The New Currency of Business

Like a lava flow, electronic document management (EDM) is a hot, growing, and pervasive element on many corporate networks. The time is right: Organizations are demanding that their document sets be treated with the same value as their corporate data. Electronic documents have become the currency of business. Many businesses have started using EDM to keep geographically dispersed groups in sync, to automate costly paper-based methods, and to eliminate process bottlenecks. At the same time, organizations are moving from a hierarchical management culture to a more collaborative style. This makes it even more essential that the corporate knowledge base of documents be managed as a corporate asset, and accessible to those who need it. On the technology side, current client/server architectures are ripe for EDM, and increased exchange of documents because of e-mail and networks begs for organization and control.

Companies See Returns from EDM

An enterprise implementing EDM can track documents better and retrieve them faster while eliminating paper storage. These benefits are transferable across industries. For example, in a telecommunications company that deployed EDM, its proposals department met deadlines better and increased the quality of its responses. Improved customer satisfaction was achieved by a mutual funds company whose use of EDM enabled faster responses to customer correspondence, and allowed for employee cross-training.

Moving towards Enterprise EDM

But until now, enterprisewide EDM could be complex. The days of single-user access and solely text-based documents are gone. Today's documents represent a variety of object types, including text, image, data, voice and full-motion video. Not only are documents themselves dynamic, but so are their sources, which can be e-mail, online databases, and information feeds.

Top 10 Benefits Realized from Current EDM Systems

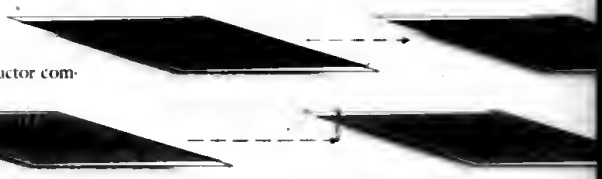
1 → Improved [illegible] document
2 → More management [illegible]
3 → Improved access to documents
4 → Faster times to develop new documentation
5 → Time savings logging paper in and out
6 → Better employee collaboration
7 → Improved management reporting
8 → Faster approval process
9 → Improved document security
10 → Improved customer client satisfaction

Source: International Data Corp.

Many businesses are finding their greatest competitive advantage is the ability to harness the document lifecycle. EDM systems manage this lifecycle from creation, revision, storage and retrieval to routing and workflow. They also allow users to work on documents collaboratively. When IDC conducted its *1995 EDM User Awareness and Buying Intention Survey*, over 80% of the respondents said EDM was critical and over 90% of them said their company had installed document management in only one or two workgroups or departments. This points to a potentially explosive market for enterprisewide document management.

Enterprise Reusability is the Key to EDM Payback

Reusability of information is EDM's main benefit, as well as the key to creating the paradigms that drive



business process reengineering. For example, a semiconductor company responding to an RFP uses enterprise EDM to access and leverage information from existing documents from various departments, including engineering, sales, finance, and legal, to shorten response time and improve business opportunities. When many people participate in the creation, review and editing of a document, EDM capabilities such as version control and check-in/check-out become essential. In a workgroup, the scope of search and retrieval broadens from one user's disk to a network full of documents.

As information overload grows, an EDM system's ability to search, dissect and reuse information becomes crucial. To satisfy such demands, EDM systems will need to be integrated with disparate sources of information such as news feeds, e-mail and a variety of corporate databases. EDM users will also have to be able to search for information intuitively, regardless of its location on the network. Finally, EDM systems will have to allow users to view, translate, edit and distribute information as it is reused.

Multiplatform, Multi-application

Because of the current mandate to deploy open systems and heterogeneous environments, EDM systems should support multiplatforms and provide open APIs for integration. No longer can a software vendor dictate the desktop environment; it must accommodate all devices on the network. EDM systems should also support many software packages, including word processing, desktop publishing, spreadsheet, imaging, and other applications important to the organization. The production department cannot be left out of the EDM loop, just because they run Quark on Macs!

With collaboration, users have both workgroup and enterprisewide concerns. And with enterprisewide EDM, organizations are faced with the challenge of heterogeneity in their document formats, repositories and networks. Such interoperability across software and hardware platforms has become critical. In IDC's survey, respondents said their chief challenge in implementing EDM was "integration of heterogeneous applications." Underscoring this, respondents indicated their most required feature: integration with existing applications.

Standards in Place

The emergence of standards signals market maturation, in this case from department/workgroup to enterprisewide deployment. The Document Management Alliance (DMA) was formed with a charter to deliver specifications for universal interoperability among all document management applications, services and repositories. The DMA includes vendors of EDM and complementary technologies, and user groups. Just as SQL once transformed the RDBMS market, so too the DMA has the potential to foster cooperation among competing vendors, boost buyer confidence and encourage more cross-enterprise EDM implementations.

EDM: A Network Necessity

Prior to the availability of enterprise EDM, locating a document over a LAN could be difficult, and over a WAN nearly impossible. With the model for collaborative work spreading, and with more users sharing documents through e-mail and the Internet, enterprise EDM has become a necessity.

Many organizations already have an enterprisewide EDM strategy in place. Those that don't can gain immediate benefits by deploying EDM at a departmental level where documents are mission-critical. The experience they gain will provide data specific to their environment, which will be vital to the development of a strategic EDM plan.

Whether implementing EDM at the workgroup or the enterprise, this is truly a case where all roads lead to Rome — and Rome is electronic document management. And when in Rome. . .

Keys To Enterprise Document Management

After losing enough time, money and productivity sifting manually through overflowing and underorganized file cabinets, or searching for an electronic document in a maze of network directories with cryptic file names, organizations have begun considering EDM (Electronic Document Management). Many of them have turned to DOCS Open from PC DOCS Inc., the overall leading choice among network-based document management packages, according to IDC's 1994 Document Management survey.

DOCS Open V2.5, the Enterprise Edition, allows users to share, manage and control documents across the major desktop platforms, including Windows, DOS and Macintosh. In addition, it supports the leading network operating systems and SQL databases.

When evaluating an EDM it is important to consider the following key issues that have been identified by industry analysts:

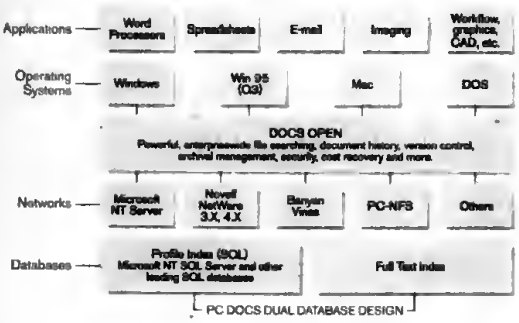
Open Architecture

An EDM must have an open architecture to tie into an organization's existing network and database infrastructure and to readily accommodate new technologies as they are available. DOCS Open has been designed around an open architecture, giving the customer the widest choice of networks and SQL databases.

With Windows, DOS and Macintosh supported in DOCS Open V2.5, the Enterprise Edition, the customer now has the choice of the operating system client as well. In addition, PC DOCS is prepared to support Win 95 as soon as it becomes available. DOCS Open takes full advantage of Microsoft BackOffice products such as Windows NT Server and SQL Server for Windows NT.

While some competing EDM packages utilize their own proprietary databases and others are limited to Unix-based solutions, DOCS Open supports the leading SQL-based vendors on all platforms (Unix, NT, NLM, etc.). The combination of DOCS Open and Microsoft SQL Server for Windows NT allows a customer to run multiple network platforms and to leverage existing database systems. DOCS Open and Microsoft SQL Server can be deployed on an existing Novell network infrastructure without costly change to network and client software.

Open Architecture of DOCS Open



Easy to Adopt

An EDM must provide an intuitive user interface to minimize training time and maximize user acceptability. From the system administrator's standpoint, the EDM must be easy to implement and administer, with features such as seamless integration with the network operating system security and replication of the database design.

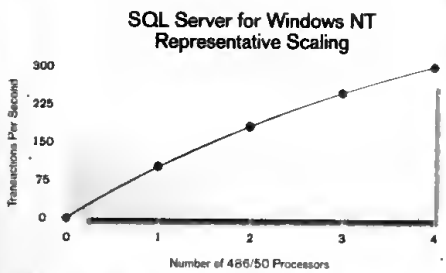
DOCS Open and Microsoft SQL Server for Windows NT are a combination that is particularly easy to adopt. Together they take full advantage of today's Windows environment, resulting in a system that is easy to use and manage, with lower support and administration costs.

Scalability

Because the volume of documents in any organization tends to grow exponentially, an EDM system must be scalable. Some companies choose to adopt EDM in stages, beginning with a departmental pilot project. The

company then scales the implementation up to multi-group and multi site, where the benefits of EDM become more pronounced, and then further scale it throughout the enterprise. PC DOCS is installed in over 2500 customer sites ranging from dozens to thousands of users who are saving time and money by managing their information efficiently.

Microsoft's SQL Server for Windows NT database has proven to be a very scalable, powerful and reliable platform for deploying DOCS Open. Symmetric multiprocessing and multiplatform capabilities allow SQL Server for Windows NT to dynamically scale to meet the needs of the larger EDM implementations, ensuring that performance and responsiveness are maintained as the demands on it increase.



SQL Server for Windows NT makes efficient use of the CPU, memory and disk I/O such that overall performance continues to increase smoothly as more processors are added.

DOCS Open with Microsoft SQL Server for Windows NT is an ideal solution for departments or workgroups as well as global enterprises with sophisticated WAN searching to find documents on any file server in any location, quickly and easily.

Application Integration

IDC's most recent EDM survey identified integration with existing applications as one of the most frequently requested features in document management systems. To be most effective, an EDM must blend unobtrusively with a user's work. DOCS Open provides the most versatile application integration capabilities through three methods: 1) Out-of-the-box integration with most popular word processor, spreadsheet and e-mail applications, including Microsoft Word for Windows and Microsoft Excel; 2) Universal Application Control through directory monitoring to track files that have been

SunHealth Supports Partners with PC DOCS

The difficulty of tracking and accessing thousands of documents was affecting customer service for a major U.S. health care alliance. So it implemented a document management system that is helping it respond quickly and efficiently to more than 300 partners in the alliance.

Every business wants to find ways to control expenses and increase productivity. And the growing emphasis on health care reform makes health care providers particularly interested in ways to manage their businesses more effectively.

This was the case for SunHealth Alliance. One of the nation's largest and oldest health care alliances of not-for-profit hospitals, SunHealth has partners in 15 states. These partners operate or are affiliated with 30 health care organizations. Together they comprise approximately 72,000 inpatient beds and provide health services worth more than $24 billion annually.

SunHealth deals with hundreds of documents each day — everything from correspondence to research papers. According to Donna Duncan, SunHealth's director of information user services, it was becoming increasingly difficult to manage all these documents efficiently. "The whole point of installing our network was to help people share information," said Duncan. "But that's exactly what we were not able to do."

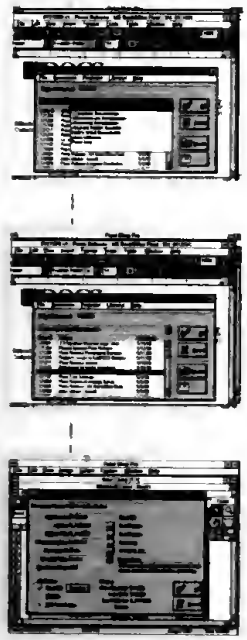
Faced with an ever-growing number of documents and no easy way to share them, SunHealth turned to DOCS Open.

SunHealth runs DOCS Open on Novell NetWare with Microsoft NT Server and SQL Server for Windows NT as the profile database.

SunHealth is now better equipped to help its partners fulfill the SunHealth vision of improving the health status of people in their communities. "Part of our overall objective is to respond more quickly to our partners' needs," said Duncan. "The DOCS Open system is definitely helping us do that."

created in any other Windows or DOS applications, such as Aldus PageMaker or Corel Draw; and 3) the ability to integrate DOCS Open with legacy software like records management and financial systems using the DO IT Toolkit (DOCS Open Integration Toolkit).

Customized to Your Business



While an EDM should provide an out-of-the-box solution for the majority of users, there are those with specialized needs that require extensive customization. An EDM must be modifiable to meet the needs of users at both ends of the spectrum.

Customers such as DuPont have made DOCS Open their standard for the entire organization because it provides an out-of-the-box solution for roughly 80% of their users. DOCS Open also has powerful tools to provide the customization and integration required by users with more specialized needs.

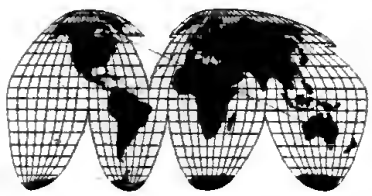
The DOCS Designer, a built-in forms generator package, allows the screens and database structure within DOCS Open to be quickly and easily tailored to the needs of different organizations and different departments. The DO-IT Toolkit is an application development environment that provides integration APIs in the form of DLLs, and OLE Automation. This allows MIS departments to create custom front-ends and extend the capabilities of DOCS Open with PowerBuilder, Visual Basic, C++, or any other OLE Automation-enabled programming language.

With the DO-IT Toolkit, the API set allows development of customized applications in a fraction of the time of other document management systems, which means faster implementation and lower deployment costs.

Mobile EDM for Global Document Access

An EDM system must accommodate mobile computing. The corporate knowledge base must be easy to access for not only workers in the office but also for those on the road. Mobile users today must be able to take a document set on a notebook and have total document management functionality. Back at the office, the edited documents must be synchronized to reflect the changes and the new documents added.

Global Document Searching



PC DOCS has designed DOCS Open to provide seamless operation whether on the network or on the road. DOCS Mobile is a fully functioning document management system that runs on a Windows-based notebook and controls check-in and check-out of documents from DOCS Open's network-based library.

The PC DOCS/Microsoft Connection

The partnership between PC DOCS and Microsoft brings to customers tight integration between DOCS Open and both the Microsoft suite of applications as well as the BackOffice suite, including Microsoft NT Server and SQL Server for Windows NT.

Microsoft SQL Server for Windows NT, a shrink-wrapped open database, makes it easy for users to install EDM software, to easily do performance monitoring and systems management, and to scale document management functions across the enterprise.

Customers have two options for SQL Server for NT: They can purchase a ready-to-run version of DOCS Open that is bundled with SQL Server for Windows NT or they can purchase SQL Server for Windows NT directly through the Microsoft channel.

One of the traditional strengths of DOCS Open is its tight integration with network-level security offered by vendors of networking products. With V2.5, DOCS Open integrates with Microsoft Windows NT Server, allowing organizations to seamlessly take advantage of advanced network operating system features in NT Server such as C2 level security.

In conclusion, organizations today are realizing that their business-critical information must be managed efficiently. The DOCS Open/Microsoft solution makes industrial strength enterprise document management a reality.

Air Force Flies With PC DOCS

The U.S. Air Force is replacing its early warning satellite system. This system, which dates from the 1950s, detects launches of ballistic missiles worldwide and notifies the U.S. military. Work on the new satellite system began in 1993, when the Los Angeles Air Force Base (LAAFB) embarked on the Space-based Early Warning System (SPEWS). For the $20 billion project, an open, scalable and customizable EDM solution was critical to the Air Force Space-based Missile Command Center.

The Request for Proposal for SPEWS was a complex 2S0+-page document with text and diagrams that needed input from Air Force staff in Los Angeles, Washington, D.C. and Colorado Springs, Colo. Creating the RFP was itself a test. Each person working on the RFP used a standalone word processor, so creating a unified document by swapping disks or hard copy was a gargantuan task. Keeping track of the latest versions so that erroneous information was not used was the biggest worry.

LAAFB first implemented a document management system that used a proprietary database, but months later switched to PC DOCS 1.0. The change was made according to Air Force Lt. Mike Alford, chief nf development for infrastructure and business practices in the SPEWS program, because the original EDM system was not SQL-based. "We wanted to be able to customize the solution and to have the highest degree of data integrity — both of which SQL and PC DOCS offered," he said. LAAFB also chose PC DOCS for its ease of use, its desktop approach with folders, its search capabilities and its openness in supporting network operating systems and databases, especially Microsoft NT SQL Server.

Alford said that searches can now be done across not only Microsoft NT SQL Server, which runs on the NT Server operating system at both the L.A. and D.C. sites, but also Oracle 7 on a NetWare 3.12 network in Colorado. "We spend less time looking for information and more time working with it," he said.

For the LAAFB, certain DOCS Open capabilities were especially attractive. DOCS Open can track up to 99 versions and 26 subversions, which all are date-stamped and have a field for user comments. It also works from within applications such as those in the Microsoft Office suite. DOCS Open does not change how Microsoft Word or Office applications work, but integrates with them to manage documents.

DOCS Open has two levels of full-text searching. It contains a full-text engine for Boolean operators, phrase and proximity searching. Users also have the option of indexing without phrase and proximity searching capabilities, which reduces indexing overhead. For applications requiring more advanced searching, DOCS Open has APIs that allow it to be used with third-party full-text searching products.

Budget constraints forced the Air Force to pull the plug on the satellite project. But its legacy lived on. The PC DOCS system was used as a benchmark across the Air Force as the model for how to efficiently complete an RFP. And when a new satellite project was subsequently revived, data from the first proposal was incorporated into a second, $26 billion proposal that is now being reviewed by potential bidders.

> "We spend less time looking for information and more time working with it."

"We were able to reuse the data from the first document, which is vital because there was a new group of people writing the second RFP," and turnover in the military is very high, Alford said.

For that RFP, the Air Force used DOCS Open. Because the software's application development capability supports OLE Automation, MIS departments with Visual Basic, PowerBuilder or other OLE Automation-enabled languages can integrate in-house applications with DOCS Open 2.S. "Object-oriented features are important," Alford said. "We are developing our own executive information system."

EDM becomes more critical as data sharing needs escalate. LAAFB bought DOCS Open for one vital project, has extended use of the product to other divisions and will soon implement workflow. "DOCS Open's scalability has allowed us to expand to about 1,000 seats on base," Alford said.

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PC DOCS software has won more distinctions than any other document management product. These include: three consecutive PC Magazine Editors' Choice awards; two consecutive WordPerfect Magazine Reader's Choice awards; Computer Reseller News Editors' Choice award; and LAN 100 Top Choice; Best of Show SCOAP Finalist; Best New Product Award, PCEB.

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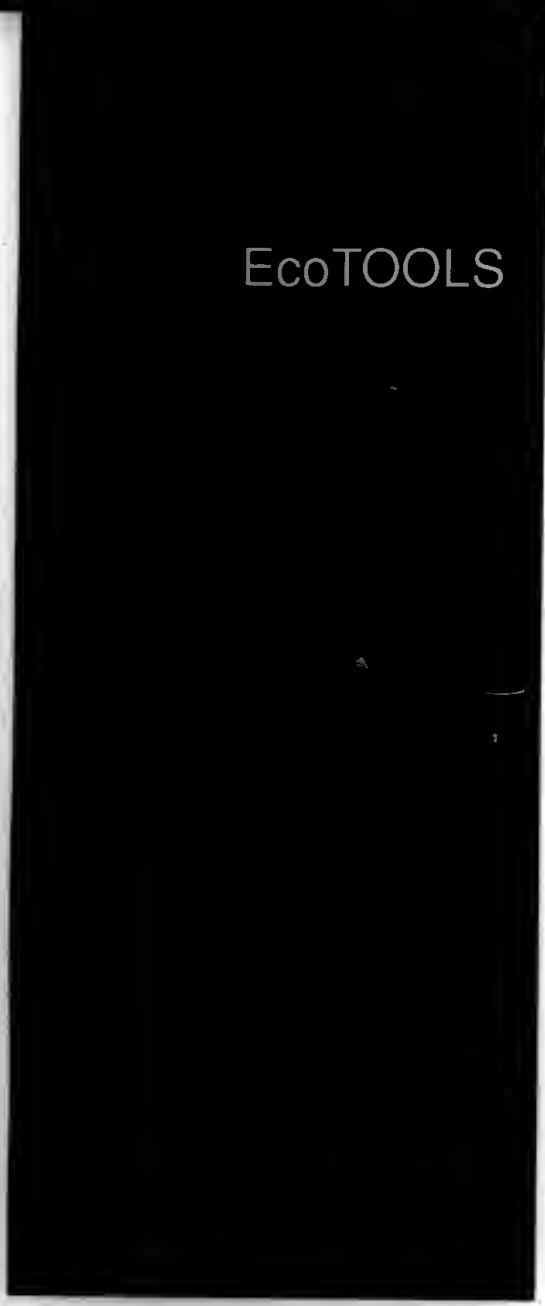

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The CW Guide to PC Servers

Taking the RISC out of Servers

Intel-based PC servers can be less expensive than their RISC counterparts, but they can also be risky investments for IS organizations

PHILIP ANDERSON

BY JOHN R. VACCA

At face value, PC servers have come a long way and boast many advantages over RISC servers.

The benefits, according to analysts and users, include the following: they're less expensive to purchase, program and maintain; they're easier for information systems to support and better at supporting older desktop applications; they're interchangeable; there are more applications available; and the applications are easier to upsize. Also, PC LAN failures have less of a widespread impact on the organization.

A PC server is "a PC sold, marketed and built as a server — typically [more than 50% of machines sold under that model name] are configured as a server," says Ted Julian, editor of International Data Corp.'s "Gray Sheet," a newsletter in Framingham, Mass. "A PC server is considered to be part of a LAN server, which is an intelligent device on a local-area network that provides various 'services' to the intelligent desktop devices on that network."

The dominant players and products in the PC server market include Compaq Computer Corp.'s ProSignia VS, ProSignia and ProLiant 1000; Hewlett-Packard Co.'s LM, LF and LC; and IBM's PS/2 Server 85, 95, 195 and PC Server family. A sign of how far PC server technology has come is that those vendors achieved almost perfect scores for hardware reliability in *Computerworld*'s Buyers' Scorecard survey, although they have a ways to go in terms of cost satisfaction (see story, page 100).

"PC servers have been designed to exploit the basic advantages of PCs to support low-cost, high-power distributed computing," says James Greene, an analyst at Summit Strategies, Inc. in Boston.

The bad news

The flip side of the PC server coin reveals some disadvantages when compared with RISC/Unix servers: limited scalability; less robust features; limitations in operating system platforms, systems monitoring and support tools; and the risk in using distributed data and applications.

Unlike RISC/Unix servers, traditional PC servers typically do not offer the ability to run more scalable, multitasking operating systems.

"Unix has been around for 25 years and is mature and proven, while the PC operating systems, even the oldest one, DOS, is only 10 years old or so," Greene says. "And it's lousy."

RISC-based systems that run

PC servers, *page 100*

INSIDE:

Users scored reliability nearly perfect in a survey of PC servers from Compaq, Hewlett-Packard and IBM. **Page 100**

What's up with the next chip generation?

A look at the vendors, benefits and key issues relating to the use of the new chips as a server platform. **Page 105**

Beware of Limits in the Software

CONTINUED FROM PAGE 99

Unix concentrate the processing power of the CPU in one box, which some say is best for transaction-based procedures such as database operations. "The inherent advantage of a RISC-based server is that they're more powerful than an Intel-based system," Greene says. "It is good for heavy transaction environments where it can take advantage of the ability to run multithreaded operating systems."

PC server tools for development and maintenance of the systems and applications are less robust than tools for RISC servers. "There's also the availability of mission-critical business applications to consider — applications such as relational databases and line-of-business [manufacturing resource planning] processing. A lot of those things just aren't available and are certainly not as powerful on a PC LAN," Greene says.

There are differences of opinion on this, however.

"Processing-intensive tasks such as word processing and spreadsheets perform better on a distributed basis like that found in a PC server-type network," says Michael Goluh, manager of management advisory services at Gursey Schneider and Co. in Los Angeles. "In this instance, the individual desktop is responsible for the CPU usage and is not sharing the CPU power of a single box."

JIM O'NEIL: "The major risk is in the use of distributed data and distributed applications."

No good solutions

Another consideration is that PC servers cannot be used at all levels of applications, according to Ray Parker, MIS manager at Ashland Oil, Inc. in Ashland, Ky. "We are still running our applications that require very large amounts of data on a mainframe because there is no good solution on the PC-based server yet," he said. "I believe multiprocessors and SQL databases are changing this, and it will soon be feasible to run these kinds of applications on PC-based servers."

PC servers are also limiting due to operating system platforms such as Novell, Inc.'s NetWare and to a lesser extent IBM's OS/2, Microsoft Corp.'s Windows NT and LAN Server and Banyan Systems, Inc.'s Vines. There are no standards for how these platforms will interact on the same network.

"The primary problem here is the ability for the application to go down and the operating system to keep on going," says Charles Knots, a systems analyst at Fox Television, Inc. in Los Angeles. "Windows NT and OS/2 are better than NetWare in this area as a result of [NetWare Loadable Module] conflicts."

Furthermore, you can get almost any operating system, such as DOS, Unix or Windows NT, to run on any machine. But you must consider how reliably the operating system performs and the availability of applications for the type of server you choose. If your application is mission critical, do you want to run risks?

Varied security

Security capabilities from one platform to another are completely different. Users do not want to log on to more than one network or system. Although, Greene says, "for the most part that's pretty well under control, though certainly not seamless. And that's worth noting when you talk about limits of the PC-based servers. If one department is running NetWare and the other is NT, you can easily access information across the two networks, but to do it seamlessly is much more difficult."

Some of the primary limitations are in the area of systems monitoring and support tools, according to Brad Koehn, MIS manager at Credit Union Executives Society in Madison, Wis. "When you have mission-critical ap-

Trustworthy? Almost

Trusting critical applications to PC servers may still be risky, but users are starting to gamble on their strengthened stability

By Kevin Burden

Reliability — or lack of it — used to be the primary reason users overlooked PC architecture servers when it came time to run mission-critical applications. Well, times are changing.

In *Computerworld*'s survey of 150 PC server users, customer satisfaction ratings for system reliability scored 8.5 or better for all three popular product lines: Hewlett-Packard Co.'s NetServer, Compaq Computer Corp.'s ProLiant and IBM's PC Server.

Those ratings place PC servers on par with their RISC counterparts, which recorded comparable satisfaction numbers when users were asked about reliability of RISC servers three months ago [CW, March 13].

Still, PC server architectures are not as stable as RISC systems, explains Lynda Fitzpatrick, a senior analyst at International Data Corp. in Framingham, Mass. "But high-level features are migrating down to these servers. [Error Correction Code] memory, redundant power supplies and RAID subsystems are making PC servers more dependable than they ever have been," Fitzpatrick says.

They are so dependable that users say they are more confident about trusting their most critical workloads to PC server networks.

"Our production applications run 24 hours a day on our network. If it goes down, we go down," says Thomas Moon, network manager at RytWay Industries, Inc. in Northfield, Minn., which runs nine HP NetServers for approximately 140 clients. "I have one server that has been up for 480 days without incident, and it's in one of our heaviest-used locations."

Brad Koehn, MIS manager at Credit Union Executives Society in Madison, Wis., runs the association's central filing system on a PC Server network. "How's that for confidence? Our organization would come to a halt if it tripped up," he says.

Failures are still a reality in PC networks. However, it was the software, not the hardware, that users often blamed for downtime.

Despite being the scapegoat when there were crashes, software was rated high in reliability for the vendors. Fitzpatrick attributes those scores to the vendors' neat packaging, such as Compaq's SmartStart program.

SmartStart CDs make it easy to install and configure ProLiant servers with Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT or Unix. Users receive an activation code from Compaq for the proper operating system and the CD does the rest, thus minimizing user error.

IBM's installation, though similar, was said to be poorly documented.

NEARLY PERFECT

Reliability

High-level features ratings boost reliability in all the servers, leaving only a narrow gap in satisfaction.

Hewlett-Packard	9.0
Compaq	8.7
IBM	8.5

and Scalability

Trusting critical applications to PC servers may still be too risky, but they have come a long way

plications, it is important that you be able to deploy those applications and then carefully monitor them. This is an area where the PC platforms are woefully lacking, and I do not see a solution in the near future," he says.

PC environments finish a distant third in terms of systems management. "Unix has support tools — they just don't measure up in comparison to mainframe tools," Greene says. "Meanwhile, PC LAN tools aren't even as good as the Unix tools because they're not as robust and not as mature."

BRAD KOEHN: "Certainly PCs tend to be less well-built for use as servers than high-end workstations, but their reduced cost can often outweigh those concerns."

Running risks

"The major risk is in the use of distributed data and distributed applications," says Jim O'Neil, deputy director of information and technology services at the Illinois Student Assistance Commission in Deerfield. "It is very difficult to ensure the stability and security of an application that resides across multiple servers and multiple desktop machines. In addition, disaster recovery planning is a current nightmare I am struggling with."

Greene concurs: "When processing power is distributed, the potential for problems is multiplied. And when you start mixing heterogeneous environments of PC LANs, Unix LANs, NetWare and OS/2 LANs, that complicates the problem even more. The greater diversity you mix in with a distributed environment, the greater the potential for disaster, so planning is crucial."

Additionally, downtime for a system means big money in lost productivity, Greene says. "In terms of lost business, if it's a transaction-based system, it is obviously best for the customer to invest in the more costly and more robust RISC solution."

However, Koehn disagrees: "I don't think that the fact that a machine is a PC is necessarily more risky than a non-PC, nor do I think that RISC/Unix is necessarily superior technology. Certainly PCs tend to be less well-built for use as servers than high-end workstations [with redundant power supplies and RAID among other things], but their reduced cost can often outweigh those concerns."

"In a mainframe environment, if something stops there are systems you can put in place that automatically start it up again," Greene says. "They'll notify you later, but they fix themselves, generally. With RISC systems you see some of that, and on PC systems there is much less. But it's getting better all the time." ■

Vacca is a freelance writer in Houston.

Cost analysis

While PC servers cost less than their RISC counterparts, do they continue to cost less in the long run?

Users and analysts have various opinions:

Comment: "Many PC servers have low-cost replacement parts and support is easily found. I would say that administrative and support costs might possibly go down slightly."

Blake Farenhold, CIO
Kleberg & Head
Corpus Christi, Texas

Comment: "It depends. The view of costs is going to be skewed dramatically if the company is moving applications from a mainframe environment with a certain set of expectations, or moving things up from a PC environment, where there will be an entirely different set of expectations. It costs as much to implement an application on a PC LAN and then control it, as it does to develop a mainframe application. But that's initial cost."

James Greene, analyst
Summit Strategies
Boston

VERY GOOD

Software reliability

CD-ROM installations have eliminated many potential problems. IBM has yet to get the hang of documentation.

Compaq	8.1
Hewlett-Packard	8.0
IBM	7.7

GOOD

Failure recovery

System software on CD-ROM may reduce human installation errors, but it won't keep NetWare from crashing.

Hewlett-Packard	7.8
Compaq	7.4
IBM	7.2

COULD BE BETTER

Service responsiveness

Compaq lacks the experience HP and IBM built while supporting large systems.

Hewlett-Packard	7.6
IBM	7.5
Compaq	6.6

The vendors:

Compaq Computer Corp.
Houston
(800) 345-1518
Internet: http://www.compaq.com
Product: ProLiant

IBM
Armonk, N.Y.
(914) 765-1900
Internet: http://www.pc.ibm.com
Product: PC Server

Hewlett-Packard Co.
Palo Alto, Calif.
(800) 752-0900
Internet: http://www.hp.com
Product: NetServer

The survey:

This survey was based on interviews with 50 users of each product. Ratings are based on a 1-to-10 scale where 10 represents extremely high satisfaction.

*Average of the vendor's ratings in each category.

"It's not hard to do, just hard to follow," Koehn says.

IBM has worked to improve its documentation, Fitzpatrick explains. "But it's still a very technical read."

Users said recovery from failure needs to be improved in all three server product lines. While these scores are not necessarily terrible, they are not at the same level as reliability either, indicating that getting these systems up and rolling is more difficult than actually keeping them rolling. It is also probably no coincidence that the order the vendors' scores fall into is identical to reliability.

And because most failures reported by users interviewed were caused by NetWare and not the hardware, recovery might be improved with the more stable upcoming NetWare 4.1.

The experience HP and IBM have at responding quickly to their traditional base of large systems users was evident in their service responsiveness scores. "Compaq has always been a PC company. It doesn't have the same seasoning IBM and HP had built while supporting their large customers," Fitzpatrick says.

"Compaq will get my questions answered — that, I expect. I'm also coming to expect a 30-minute wait on hold before I can even talk to anyone," says Jim Wall, PC department manager at Sigma Aldridge Chemical Co. in St. Louis. "But at least you typically get through to them on the first call." ■

Burden is *Computerworld*'s senior researcher, Firing Line/Scorecard.

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2:00 p.m. - 5:30 p.m.	T7 Objects in Business N T8 Growing a Software Reuse Program ●	T9 Components, Frameworks and Objects ●	T10 Understanding Distributed Object Technology N	
Monday, August 14	**TUTORIAL PROGRAM**			
9:30 a.m. - 5:30 p.m.	T11 Object Models: Strategies, Patterns and Applications E T12 Object-Oriented Business Engineering N	T13 Introduction to Object Technology N	T14 Introduction to Client/Server Development Using CORBA ●	T15 Object Catalyst: A Workshop on Rigorous Object Development ●
9:30 a.m. - 1:00 p.m.		T16 OpenDoc Primer N	T17 Understanding Distributed Object Technology N	T19 Managing Object-Oriented Projects N
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45 p.m. - 5:15 p.m.	• Applying the Object-Oriented Software Development Cycle ● • Object Technology and the Mainframe ●	• Iterative Development for Object-Oriented Projects ● • Frameworks and Components: The Path to Reusable Software ●	• Lessons Learned in Distributed Object Computing ● • A Comparison of COM and CORBA ●	• The C++ Standard Library: As Reality Settles In ● • Automating Associations in C++ ●

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39. 1000-4999
40. Over 5000

F. Which functions do you perform in regard to object technology? (circle one)
41. Final Decision Maker
42. Specify
43. Recommend
44. Approve
45. Develop/Use
46. Resell
47. Other _____

G. Which of the following object-oriented products or services are you interested in?
48. C++
49. SmallTalk
50. Eiffel
51. Frameworks
52. Analysis and Design Tools
53. Visual Programming
54. Portable GUI Builders
55. Development Environments
56. Distributed Management Facility
57. Class Libraries
58. Databases
59. None

☐ Check here if you are disabled. Please attach a written description of your needs.

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BY E-MAIL: Send to: OMG@OMG.ORG. Type the word "help" by itself in the body of your letter, and the server will send you complete instructions. To receive a list of available files, type the word "index" on a separate line.

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CHIPS Ahoy

The next generation of server microprocessors will be available by year's end. After that, PC servers will never be the same

PowerPC

IBM, Armonk, N.Y. (914) 765-1900
Motorola, Inc., Tempe, Ariz. (602) 438-3000

- 160SPECint92 at 100 MHz
- 200SPECint92 at 133 MHz
- 180SPECint92 at 120 MHz
- Dual 16K-byte instruction and data caches
- IEEE-754-compliant floating unit

Intel P6

Intel Corp., Santa Clara, Calif. (408) 765-8080

- Up to 1,500 trans./sec.
- 256K-byte cache per CPU
- 200 SPECint92 at 133 MHz
- Four P6 chips can be linked
- About 80% higher performance than Pentium

What people are saying

"NT is a nice option. But unless we're forced to put it on our PowerPCs [Groupe Bull Escala] — and the high cost of maintaining AIX might do that — we have no plans for it."

— Frank Ross
Assistant vice president of MIS
Gilman Paper, St. Mary, Ga.

"P6 servers will need to show a significant increase in performance for us to upgrade from our already-stable Pentiums."

— Charles Knotts
Systems analyst
Fox Television, Inc.
Los Angeles

"We are not even fully exploiting the current Pentiums yet. We'll go to P6 only when the price and applications make it real attractive."

— Jim Wall
PC department supervisor
Sigma Aldrich Chemical Co.
St. Louis

By Kevin Burden

If you are committed to high-performance PC servers, brace yourself for interesting times.

In the third quarter, Intel Corp. will deliver the P6, which is the code name for the next generation of x86 architecture chips and successor to today's Pentium. And the PowerPC alliance of IBM/Motorola, Inc. will hatch several new varieties of the PowerPC, which is seen today primarily in Apple Computer, Inc.'s Power Macintosh and IBM's RS/6000.

Despite Pentium's popularity, it has been viewed as trailing in performance when compared with top-of-the-line RISC chips from Digital Equipment Corp., Sun Microsystems Computer Corp. and IBM/Motorola. And though the P6 is not expected to make Intel performance king of the mountain, it will provide Intel-loyal users with a newly architectured chip with nearly twice the speed of the current Pentium. Although true server speed will be far from double once disk, memory and video variables are factored in.

Also debuting this fall will be several PowerPC chips that could find their way into servers. They include the 100-MHz PowerPC 604 and the 130- or 150-MHz PowerPC 620, which is expected to eventually hit 200 MHz. Both will probably beat the P6 in straight throughput.

Intel will then counter in 1998 with the P7, according to analysts. The P7 will likely be the first chip from the Intel/Hewlett-Packard Co. alliance and the first to break the x86 architecture. "This market [microprocessors] will always be a moving target. Those on top today are not necessarily going to be sitting there tomorrow," says Dean McCarron, principal at Mercury Research, Inc. in Scottsdale, Ariz.

Chip wars

Other chips, such as the K5 from Advanced Micro Devices, Inc., may see some use in servers, but it is "essentially a Pentium 'pin out' — meaning it will most likely be used to extend the life of existing server lines," McCarron says. "K5 does have substantial performance advantages over Pentium, but it's not a competitor to P6."

The P6 was specifically designed for servers, and it should make a considerable impact on its target market when introduced, according to Linley Gwennap, editor of "The Microprocessor Report" in Sebastopol, Calif.

P6 server performance will benefit from the 256K-byte cache chip that is physically attached to the CPU chip. But manufacturing a two-chip processor is expensive, and the costs will initially be reflected in server prices.

However, Gwennap says seamless multiprocessing, native Microsoft Corp. Windows and Windows NT and Novell, Inc. NetWare support might be enough to keep PC server users from looking back at RISC.

Users can be sure every server vendor has schemes for P6 systems, and some such as Compaq Computer Corp. and Dell Computer Corp. are already making their plans known. Compaq will formally announce next year a cluster of four quad-processor P6 servers positioned as a mainframe alternative [CW, May 29]. And Dell is readying a P6 quad-processor rack-mounted server, which it expects to announce in the third quarter.

Keeping up

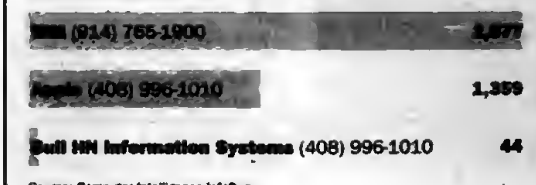
The new PowerPC 604 and 620 will keep this architecture apace with Intel's performance gains. But the limited number of vendors using this processor (see chart at left) puts the architecture at a disadvantage. New support for Windows NT may be the shot in the arm this chip needs.

Because these servers previously supported only Unix, OS/2 and Mac OS, depending on the vendor, they have remained in graphics and technical environments. "With NT, PowerPC could become more widespread," Gwennap says. ■

Who's selling multiuser PowerPCs?

In the market for a PowerPC server? Your options can be counted on one hand. Several more vendors will spring up this year but with very little market impact.

Number of actual unit sales, 1994



Source: Computer Intelligence InfoCorp

Sound Off!

At issue:

Microsoft bashers should stop whining and let competition take its natural course in the software arena, says one industry watcher. That's crazy, says his opponent. Microsoft is on a rampage, and the Department of Justice should rein the company in.

Is Microsoft

Let free market forces deal with Microsoft

By Howard Anderson

The specter that scares the hell out of the computer industry is an untethered Microsoft Corp. that has no constraints and is careening out of control like a Freddy Kruger monster on steroids, devouring everything in its path. It is a nightmare of a world in which Microsoft computers run Microsoft software over Microsoft networks through Microsoft gateways attached to Microsoft servers.

In the nightmares of these paranoid prointerventionists, no "alien" products can survive. So software companies become vassals of Microsoft that kiss rings and hope against hope that The Lord of the Universe doesn't become displeased with them or that their market niche won't garner enough attention to attract the overbearing giant.

What pisses people off in the industry most is not that Bill Gates is their technological superior. We expect that. It's that Gates turned out to be so much better a businessman than anyone else, and that includes virtually everyone — Andy Grove, John Scully, John Akers, Scott McNealy, Jim Manzi — you name it.

How much better? Well, put it this way: A stack of one thousand dollar bills six inches high is $1 million. Gates' net worth, stacked in one thousand dollar bills, would be as high as a 400-story building. Let me help you. Look up. Straight up. One mile up.

Is this why people think Microsoft should be shackled? Because Gates plays the free market game too well?

What about the lessons learned in our first economics course? We learned that monopolization was bad and competition was good, and the free market performed a version of Darwinism by allowing the worst products and companies to die. Then came the Democrats who decided that size alone was an indication of bad and attempted to handicap the race by using the Antitrust Divisinn of the U.S. Department of Justice as the policing body.

Stella Kramer

As Brother Bill is quick to point out, Microsoft is only the 20th or so largest company in the industry. So, by size alone, he is neither "out of control" nor able to monopolize. There is no douht that Microsoft's clout is enormous despite its "small" $7 billion size, but that still doesn't mean the company should be bobbled by some Justice Department decree.

Let market competition work the way it's supposed to. If Microsoft has monopolized anything, it's hrainpower. The scariest scenario isn't Microsoft's market domination, hut the hundreds of young "Bill clones" with celestial IQs running around Redmond, Wash., wearing khaki pants and Kmart shirts and talking at hyperspeed about cyberspace. Microsoft is building the talent set to dominate the computing world for the next 20 years.

Am I suggesting that Microsoft has a monopoly on brainpower? You bet I am. The brightest 20-year-olds in the industry all want to work for Microsoft. But as far as I know, stockpiling talent doesn't violate the Sherman Act, the Clayton Act or any other antitrust legislation.

If you're worried about an incipient backlash, where users and the rest of the compnter/software

Anderson, *page 108*

out of control?

By Martin A. Goetz

You bet Microsoft Corp. is out of control. It has a monopoly in the PC operating systems market and owns about 75% of the office suite market. Market forces just aren't working to keep the company in check.

Not only is Microsoft out of control, but it is also in complete market control. And the effect the Microsoft monopoly will have on the computer industry and markets is to reduce innovation, eliminate competition and increase prices. We can't let Microsoft continue down its path unchallenged.

The computer industry is at Microsoft's mercy. For instance, its practice of bundling and tying in as many new functions and product areas into its operating system is putting the squeeze on other companies and reducing competition.

Areas such as utilities, database management systems, word processors, spreadsheets, electronic mail, presentation graphics, project management, communication software (e.g., fax, TCP/IP, monitors and so on), sorts, compilers, development tools, accounting packages and gateways to proprietary networks (including The Microsoft Network) are all candidates for bundling.

If Microsoft is not stopped from its bundling strategy, software companies will abandon these markets and users will be left completely dependent on Microsoft. If that happens, the competitive forces necessary for innovation and technological advances will vanish.

What else can companies do when, for example, Microsoft recently announced it will include free TCP/IP software in Windows 95? In the short term, this may be attractive for users, but in the long term, it may drive other vendors out of the market and eliminate user choice.

Corporate information systems managers are also getting nervous because Microsoft is using its monopoly in PC operating systems to leverage and monopolize other aspects of software from desktop applications to mission-critical, on-line applications. The existence of a vital third-party software market gives users a free choice. Many of Microsoft's customers are questioning if the company is acting in their best interests as it attempts to eliminate competition.

It certainly can't be good news for the user community that Borland International, Inc. is up for sale and Lotus Development Corp. is currently unprofitable, reducing its staff and facing a merger with IBM. These companies have been innovators and leaders, but the market forces that should have leveled the playing field for them have been absent. Is Microsoft Office really a better set of products than Borland's or Lotus' products? Many think not. Microsoft is just out of control.

Currently, there is nothing to stop Microsoft from providing interface and design information on its PC operating system monopoly to its own applications group before the company provides it to its partners and competitors. This may be smart business, but it is unethical and unfair — and it may be

Goetz, *page 108*

The government has to stop Microsoft now

Is Microsoft out of control?

Anderson

CONTINUED FROM PAGE 106

industry band together to fight Microsoft, think again. Users don't care as long as they get what they need. Most computer shops are already dealing with more vendors than they care to. Most users want fewer vendors; they just want more from them. Microsoft offers to rationalize their environment, so users are strongly in their camp. Should the Justice Department regulate against a market scenario users are happy with?

What Microsoft has done is reset the playing field to its advantage. Microsoft had only one initial advantage: ft was anointed by IBM and the MS-DOS decision that made it the de facto standard.

Napoleon once said the key to winning is never to interrupt your enemy when he is making a mistake. From that, Gates took the war ebest he was compiling from his de facto standard and moved into the application area. Fair? Yes. Legal? Certainly. Nice? Come on now!

So what's to prevent a completely Microsoft-overrun world if the Justice Department doesn't step in to level the field? There are several factors, and they hearken back to that economics course. Don't compete with your own customers. Don't get so big that you start fumbling the ball.

Here's where Microsoft's delayed reaction to the Intuit, Inc. deal may hnrt.

All of The Yankee Group's largest banking and financial services firms have been asking, "Why are we continuing to make Microsoft one of our strategie vendors when it is clear that a consumer-oriented home banking produet over a Microsoft network is directly competitive with our checking/loan hustness?"

In response, a significant number of the Yankee t00 banking clients want to migrate to a lesser dependency on Microsoft. This is an area of vulnerability for the company because it has, in the minds of a serious segment of the market, violated the implicit and unwritten contract about not competing with your customers.

The major beneficiaries of this backlash are firms such as IBM, Computer Associates International, Inc., Lotus Development Corp. and Novell, tnc. But let's not overstate the case. The majority of end users are very happy with Microsoft

Also don't forget that the current havenots of the industry want to be Microsoft's partner, while at the same time, they don't want Microsoft to get too powerful. In the short term, they have no option; they must swear their allegiance to Windows 95, while trying oot to pick an application area that falls in the way of the Microsoft juggernaut. At the same time, they continue to search for somcone to dissipate Microsoft's domination.

Whether they succeed remains to be seen. Any coalition or consortia without leadership is doomed. And that leader has yet to make itsetf known. Intet Corp. seems quite content to sit on the sidelines. Novell and Lotus (or some IBM incarnation thereof) are possibles, hut each has its own agenda. The Yankee Group finds that their antipathy toward Microsoft is loud hut not deep.

Who then stops Microsoft? Microsoft itself. Its own size will slow it down. Its internal bureaucracy will cause enough balls to be fumbled to turn users from sullen to mutinous, aalting the rest of the computer industry behind some, no any, non-Microsoft approach that is technologically elegant enough tn survive. That's the good news for other vendors and the continuatioo of the free market economy. The bad news is that Gates sees this coming and is reinventing Microsoft right now.

ft is axiomatie that every technology company will hit "The Walt." Has Microsoft hit its wall or is it immune? The truth is that Microsoft has hit The Wall again and again — except that its competitors and the consortia were never able to leverage those late releases. Today, Microsoft is essentially bulletproof. This is not because The Children's Crusade up in Redmond didn't make mistakes, but because its competitors, time and again, made more.

The bottom line: Companies will have to learn to deal with Microsoft in the marketplace — not in the courts. ■

Goetz

CONTINUED FROM PAGE 107

illegal uoder antitrust laws.

Without being forced to, though, Microsoft is not about to change its disclosure policies. So where are the limits? Can Microsoft decide to withhold information from its competitors indefinitely? Can it make interfaces exclusively available to the Microsoft applications group while a dependent user and vendor community sits and waits?

There is nothing — no government agency and no consent decree — to prevent this from happening. In the past, tBM, Eastman Kodak Co. and other dominant vendors have been forced to reveal interface information to their competitors. Why is this situation different?

Microsoft has litteral control of the survival of other companies ptaying in the same markets because of its PC operating system dominance. Once those companies have been overtaken, users will he left with oo place to turn.

Stay in Microsoft's good graces — or else

Microsoft likes to predatorily preannounce products to "freeze out" other companies from successfully selling products. That's what Microsoft has been accused of doing to Borland's TurboBasic and Turbo C prodncts. Some may argue that this is just good strategy. It's OK, they argue, for a company with sales of $5 billion-plus, with pretax profits of $2 billion-plus, pretax margins approaching 40% and an annual growth in earnings of 55% to knowingly and intentionally freeze the market through vaporware announcements. I don't see the fair market competition in that.

Microsoft got to where it is today with good products and talented employees. No one can take that away from it. But that dominance has now veered out of control, and it is to the detriment of the market and the entire industry.

Only the U.S. Department of Justice can rein in Microsoft.

Stopping Microsoft's arqnisition of Intuit, Inc. was a good first action. But there are other actions the Justice Department should pursue as well. They include the following:

- **Bring an antitrust snit against Microsoft.** A government suit would have an immediate, positive effect on other software companies hy causing Microsoft to become more cautious and self-controlling just as IBM did in the t970s.
- **Openly propose that Microsoft be broken up.** Breaking up a monopoly worked in 1910 against Standard Oil. ft worked in the f950s against IBM. And it worked in the 1980s against AT&T Corp. The breakup of these monopolies didn't stop them from continning to be highly successful, but it did levet the playing fietd for honest and fair competition.
- **Apply the concept of maximum separation.** The conrts have the ability to prevent the use of economie power in one distinct line of commerce for competitive advantage in another. Applying it to Microsoft would require the company to have separate physical facilities, personnel, company names, research groups and acconntability for profit and loss. It would also prohibit advances of capital and/or loans between firms and permit exchange of services and products between the companies only on an "arm's length" basis.
- **Seek a prelimfnary injunction against Microsoft.** At the moment, companies seeking to fairly compete simply can't. They need to be able to reverse-engneer Microsoft's operating system to achieve interoperability. The Justice Department should require Microsoft to provide IBM, for instance, with whatever it needs to make OS/2 Warp compatible with Windows 95.

Further, Microsoft should be reqnired to separate its operating system groups and applications groups. The government should force the firm to operate its planned Network Service Division as a separate unit during the suit.

Finally, the Justice Department should bar Microsoft from all acquisitions until the suit is settled.

A healthy market depends on growth, innovation and fair competition. That will result only if Microsoft is brought under control. ■

Let market competition work the way it's supposed to.

Sound Off!

The computer industry is at Microsoft's mercy.

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Studying for an exam has never been easier

A test in Jest

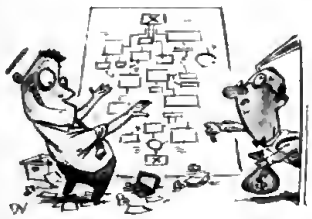
By Mike Cohn

Considering a new job? You're not alone. In fact, every 14 seconds someone in the U.S. updates a resume, interviews for a job or seriously sniffs up to the head of personnel.

Now you have all the help you need. Here's the most important career-enhancing vehicle you'll ever find: the first-ever information systems aptitude test!

You have 30 minutes, so get out your No. 2 pencils. Bring the test to your next job interview and ask the receptionist to grade it. I bet she won't let you in the door without it . . . or at least won't validate your parking.

Part I. Project chronology



You can't climb the career ladder unless you know how to run a project. Number the following project steps chronologically from 1 to 10:

___Buy the hardware at a huge discounted price
___Find the hardware two days later at an even better discounted price
___Meet with users
___Argue with users
___Discover that the chief financial officer has canceled the project
___Make a "build or buy" software decision
___Try "build" for 28 months, then decide to "buy" and hope nobody notices
___Plan to "exhaustively" test the system
___End up barely "sort of" testing the system
___Ask for a promotion

Part II. Battlefield decisions

Technical skills are crucial, but companies really look for candidates who are decisive, responsible and ethical (not to mention masochistic and pathetically submissive). A good IS pro must be able to quickly listen, think and act. Choose the correct response:

1) You have just worked 86 weeks straight, and you finally stabilize the system. As you pack your briefcase for your first real weekend since 1981, the chief information officer pops in and says: "I forgot to mention that darn IS audit. I'll need all 7,200 pages of system documentation updated on my desk first thing Monday." You stop what you're doing, look him in the eye and say:

a) "Gladly, as long as I may not-too-carefully insert it one page at a time into a spot located between the belt and the back of your knees."
b) "It would be a pleasure because I know you're still considering that small raise that I so-forwardly requested back in the summer of 1987."
c) "Thank you, sir. May I have another?"

2) You support the local air traffic control system. You learn the system has been down all morning and suddenly remember you made a secret, untested change last night. Do you:

a) Fess up and try to resolve the problem before anything happens.
b) Responsibly restore the system from yesterday's back-up tape . . . except that you forgot to make one.
c) Make a mental note not to fly for a few days.

Test, *page 113*

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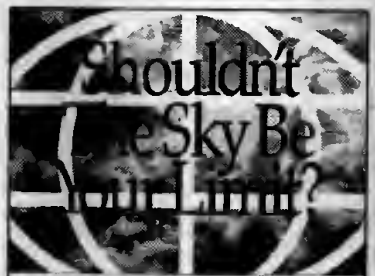

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A test in Jest

CONTINUED FROM PAGE 112

Part III. IS Jeopardy

In this area of instant information, everybody has answers! It's knowing the question that's the most valuable skill in IS. For the following answers, circle the question that is most appropriate:

Answer:

1) Several hundred concurrent users.
- a) "What do you get when 1,000 people hit Enter?"
- b) "What do you get when you work the help desk?"
- c) "What do you get when you give your Visa number on the Internet?"

2) 12/31/1999.
- a) "When will you finish working on Year 2000 system changes?"
- b) "When will you start working on Year 2000 system changes?"
- c) "What's a good night to turn off your pager?"

3) A master's of science in information technology with a minor in global economics.
- a) "What do you need on your resume?"
- b) "What do you need on your resume, especially if you don't know C?"
- c) "What, with 25 cents, can get you a cup of coffee?"

Part IV. Matching

Draw a line between the phrases on the left and the correct explanation on the right.

Distributed computing	A confusing architecture
Client/server	A really confusing architecture
Legacy systems	Expensive and in production
Object-oriented systems	Really expensive and years from production
Layoffs	Streamlining processes and staff
Re-engineering	Strategically streamlining processes and staff
Internet security	The most elusive goal of the '90s
Hotel reservations for Comdex/Fall	The second-most elusive goal of the '90s

Part V. Essay

Finally, the most important question on the test. An IS career has good and bad points. There are long hours, often in total isolation, faced with stress, pressure and torment, and that's the good stuff. Why are you here? Why did you choose IS?

Collect your thoughts about all the things that make IS an exciting, fun and fulfilling career, then carefully list them in the space provided below.

Cohn somehow remains employed at a large computer company in Atlanta.

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- POWERBUILDER, SYBASE
- UIM/X DEVELOPER
- ORACLE 7, SQL FORMS

◆ SOFTWARE ENGINEERING ◆

O-O DEVELOPMENT
- MAC GUI, MacApp MPW
- MAC GUI, CodeWarrior
- VISUAL C++, MFC, NT, WIN 32 API
- VISUAL C++, MFC, IMAGING EXP
- C++, SYBASE API
- C++, WEB SERVER INTERFACE
- C++, WINDOWS, WINSOCK
- C++, UNIX, TCL, CLEARCASE
- VISUAL BASIC, SYBASE
- WINDOWS ARCHITECTURE (FROM UNIX)
- VISUAL BASIC
- O-O DISTRIBUTED SYSTEMS
- MULTI-PLATFORM COMPATABILITY (WINDOWS, UNIX, OS/2, NT, MAC)
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Ref#P0595-ETN0082

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Ref#E0694-ETN0033

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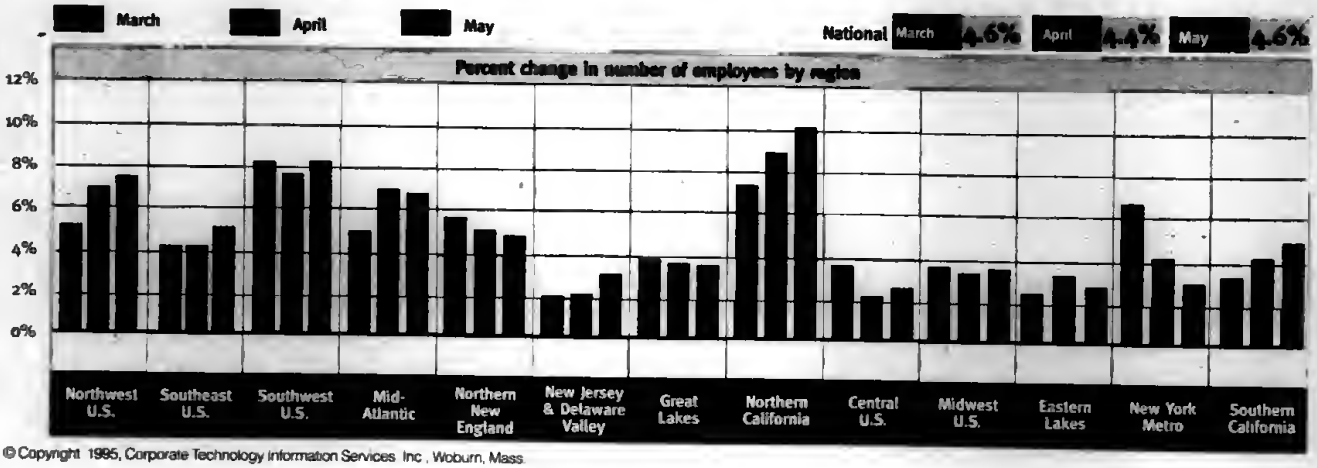

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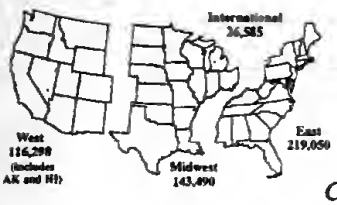

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It's Monday morning. The Sunday paper was chock-full of information superhighway articles and ads for cheap PCs.

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BY LESLIE GOFF

You can't get them to leave you alone. Everyone's a technology expert with a brilliant idea for a new application or an urgent need for a Pentium PC. Moreover, they know the perfect place to get everything at rock-bottom prices. Their eyes dance, and they pull up a chair to talk about the World-Wide Web. Then they casually leave behind a couple of articles they've clipped.

With savvy power users as your allies, who needs enemies?

Actually, information systems pros say they welcome the attention and enthusiasm from users, but they struggle with how to gently restrain the impulses of senior executives and others who know just enough to be dangerous.

"Management by magazine" is how Thomas Loane refers to this syndrome. "You just can't read as many publications as your users can," says the vice president of computers and communication services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla. "They get all of these magazines on the newsstands and they believe everything they read. So you know you are going to be blindsided."

Trying to bring the desires of executive-level users down to earth is a common problem. Chris Leuty, computer systems supervisor at American Airlines' Flight Academy in Fort Worth, Texas, says his users want to discuss every technology they read about, such as multimedia, digital video and the Internet. Moreover, they want to be able to put it on any desktop — now. "I end up giving a lot of impromptu reality lessons to senior management about what these things really do and how we can or can't use them," Leuty says.

Reality sets in

If Brian Jaffe, manager of client services at a large pharmaceutical firm, had his druthers, he would cancel every executive's subscription to *The Wall Street Journal*.

"We're dealing with executives who see [technology] ads on TV during football or case studies in the *Journal* and we have to counterbalance that hype with some down-to-earth reality," Jaffe says. "I try to make them aware of the training, implementation and people costs and flesh it out for them without appearing to be a wet blanket.

"What seems to hit me the most is that my boss or someone up the food chain starts comparing prices," Jaffe says. "Oftentimes, an ad in the Sunday paper will bring them into my office asking, 'Why aren't we buying these? They're really cheap.'"

> **"We're dealing with executives who see [technology] ads on TV during football or case studies in the journal and we have to counterbalance that hype with some down to earth reality"**
>
> — Brian Jaffe, manager of client services at a large pharmaceutical firm

Of course, they aren't cheap once you add the appropriate network cards and add-ons to meet your configuration, put in a LAN drop and swap out the prebundled software for the applications your site uses. But Leuty diligently tracks down the vendor for quotes anyway.

"Then they see that the PCs in the ad would be too expensive," he says. "In the meantime, I end up spending a lot of time calling around to get quotes in order to satisfy them and to back up my case."

Loane, who frequently hears requests for workgroup applications and imaging systems, says he counters ad hoc requests from new zealots with a key strategic question: "How will this make money for Alamo?" And then he patiently awaits the answer.

"What I'm trying to say, politically, is, 'Where is this dumb idea coming from?'" he laughs. "But asking it gains the respect of the upper echelons and will lead you to the problems users are trying to resolve."

If the user can't make the business case for a request, Alamo has a purchasing approval mechanism in place to head off spontaneous purchases. Moreover, IS will guarantee support only if the product is sanctioned. "If a technology won't make us money, we shouldn't implement it," Loane says. "We're a business, not a toy store." ■

Goff is a freelance writer in New York.

Users Я Us

Users poetic about surfing the 'net or going interactive often seem more like kids in FAO Schwartz than people with jobs.

For example, Brian Jaffe's users are constantly asking for Internet access and CD-ROM drives. But at this point, Jaffe, manager of client services at a large pharmaceutical firm, says he's found little work-related value in either one — despite his best efforts.

While his company considers making CD-ROM drives part of its standard PC configuration, Jaffe has noticed that the few users who already have drives call the help desk to complain that the music won't play over the speakers. "What are they really doing with those drives?" Jaffe wants to know.

Internet access is easy enough to provide, and making it a standard icon on the LAN would be painless, but Jaffe says he's found that usage wanes considerably after the first week.

"It's interesting and a lot of fun to play with, but going out and finding a Web site applicable to your needs can be a full-time job," Jaffe says. "So, when I get a request, I say, 'We'd love to give you access. What do you hope to use it for?' I chat with them to discuss what they may actually find on the 'net and what they may not.

"We have large numbers of employees who have better PCs in their living rooms than in the office, so that becomes a competitive arena for IS," Jaffe adds. "It's frustrating, but it keeps you on your toes."

— Leslie Goff

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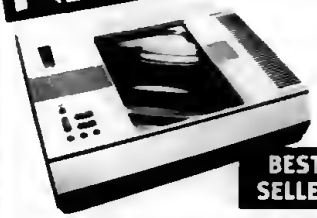

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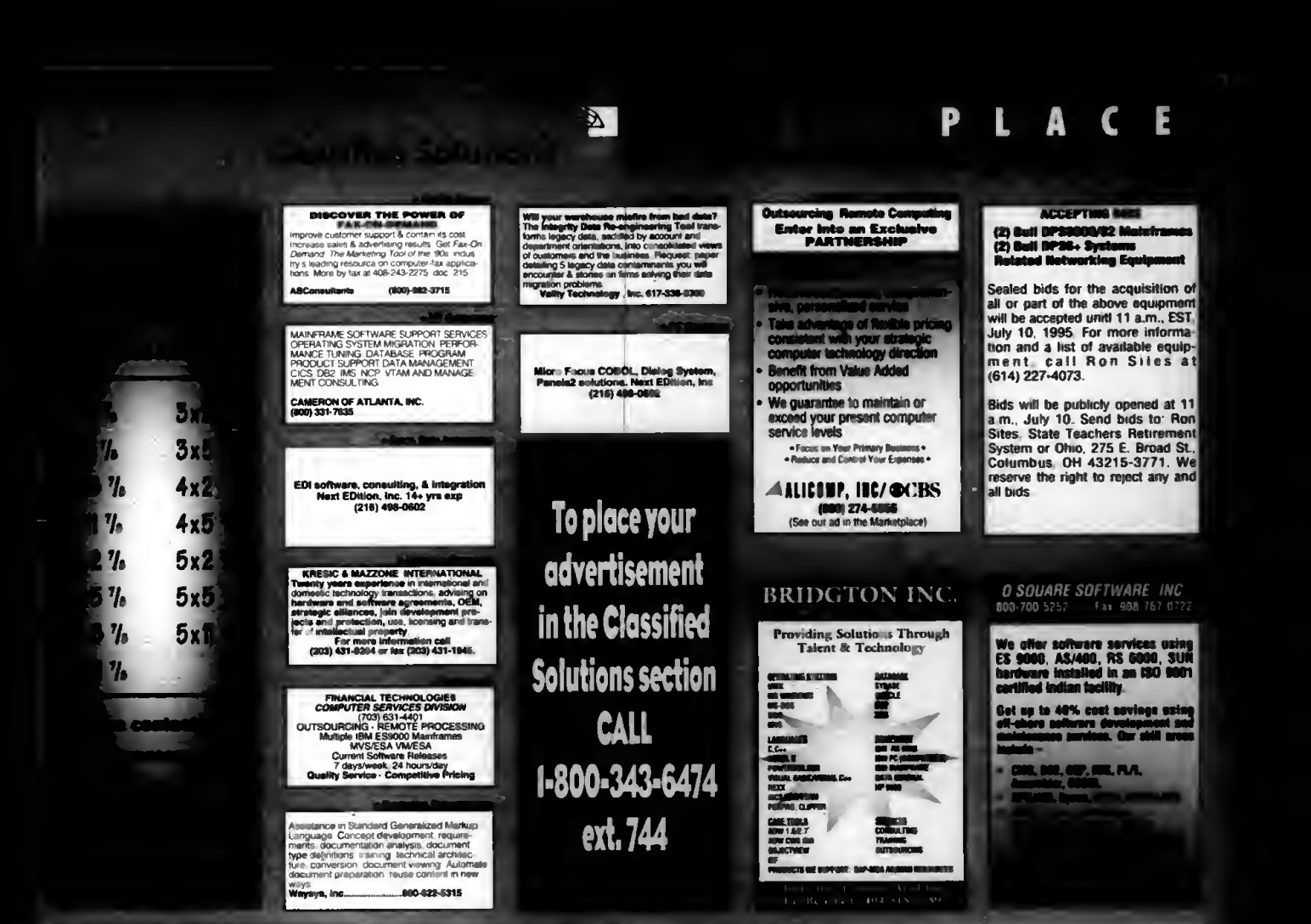

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June 16 Stock Ticker

Gainers Losers

Percent

Bay Networks(O)	27.8	Information Resources(O)	-24.6
Newman Data Inc.	58.6	Cray Computer	-14.3
Rasterops(O)	27.8	Encore Computer Corp.(L)	-12.5
Intelligent Data Systems	26.5	American Software Inc.	-10.9
Magic Software Enterprises	25.4	Racotek Inc.	-9.5
Cambex Corp.(O)	22.5	Xircom Inc.	-8.6
Imagon Corp	21.1	Amazing Inc.	-6.3
Ross Systems	19.4	Data Race Inc.	-5.9

Dollar

Texas Instruments	33.25	Information Resources(O)	-4.25
US Robotics(O)	91.75	Dell Computer Corp.	-2.63
ITT Corp.(N)	7.13	Network Equipment Tech.	-1.25
Intuit Inc.	4.88	Emulex Corp.	-1.13
BMC Software Inc.(N)	6.38	Maxtor Corp.	-1.00
Fluent Corp(N)	5.75	3 Com Corp	-0.88
Newlett Packard Co.	5.63	Data Race Inc.	-0.75
LSI Logic Corp	5.63	Compaware Inc.	-0.75

Looking inside out

Sometimes where there's smoke there's fire, and sometimes it's just a lot of hot air

But right before two recent announcements related to IBM, price moves in the affected stocks prompted suggestions of insider trading.

The day before **IBM (IBM)** announced its hostile takeover bid for **Lotus Development Corp. (LOTS)**, Lotus shares jumped three points, prompting a Securities and Exchange Commission investigation into possible insider trading. Heavy insider selling of **Chipcom Corp. (CHPM)** shares last month came just before the company announced reduced sales to IBM, one of its main customers. The sales resulted in a shareholder lawsuit, though analysts are optimistic about the networking vendor's future.

"The bad news was the IBM deal. The good news is that everywhere else Chipcom is doing well," said Roxanne Googin, an analyst at Gruntal & Co. in Beverly Hills, Calif. "Even outside of the IBM deal, they are growing at 50% a year."

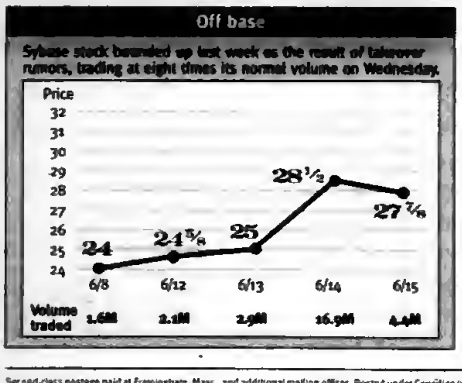
But what of **Sybase, Inc.'s (SYBS)** rising stock price last week? The Emeryville, Calif., database firm went through the takeover target rumor mill again thanks to heavy afternoon trading of its shares (see chart). David Benhaim, vice president of First Albany Corp. in Boston, does not see any truth to that rumor, chalking it up to short taking, or making money on the expected drop of a stock's price.

Benhaim said that among database vendors, **Informix Software, Inc. (IFMX)** would be the best target for a takeover, especially by the likes of IBM. He cited Informix's lead in technology, strong ties to both hardware vendors and client/server software providers and an IBM heritage in management that would provide a smooth transition.

—Tim Ouellette and Stewart Deck

Off base

Sybase stock bounded up last week as the result of takeover rumors, trading at eight times its normal volume on Wednesday.



Each	52-Week Range			Bid	Net Change	Pct Change
Communications and Network Software						
OTC	49.25	21.69	1 Cisc Corp	41.88	-0.88	1.4
NYS	46.88	37.88	AMERITECH Corp	45.88	3.50	7.9
NYS	56.50	47.25	AT&T	51.88	1.25	2.5
OTC	45.38	5.63	Aspect Communications	44.75	1.00	2.3
OTC	19.75	11.88	Banyan Systems Inc. (L)	13.00	0.88	7.2
OTC	41.13	16.63	Bay Networks Inc. (N)	40.75	-0.50	-0.9
NYS	58.50	48.38	Bell Atlantic Corp	50.50	2.75	5.1
NYS	63.50	50.50	Bellsouth Corp	63.50	3.50	5.6
BYS	22.25	10.00	Bolt, Beranek & Newman	18.13	0.50	2.8
BYS	21.25	9.00	Broadband Technology	15.75	2.25	16.7
NYS	56.50	33.91	Cabletron Systems	52.00	-0.38	-0.7
OTC	22.75	10.00	Certiphan Communications	13.75	-0.75	-1.8
OTC	50.50	20.00	Chipcom Corp	23.50	0.88	3.8
OTC	18.63	18.75	Cisco Systems Inc. (N)	48.63	2.50	5.4
OTC	13.00	0.13	Compression Labs Inc.	0.75	0.00	0.0
OTC	11.25	5.13	Computer Network Tech. (N)	10.88	1.38	14.5
OTC	14.50	7.50	CrossComm	12.13	0.25	2.1
OTC	6.50	2.13	Data Switch Corp	4.19	0.00	0.0
OTC	63.00	17.88	DSC Communications	43.00	4.81	12.6
OTC	41.75	11.50	Gore Systems Inc	27.25	0.50	1.9
NYS	35.88	27.75	General Dataccom Inds.	31.75	0.13	1.1
NYS	34.88	29.50	GTE Corp.	33.63	0.25	2.3
NYS	118.25	77.00	ITT Corp (N)	113.63	2.13	0.6
OTC	25.88	17.75	MCI Communications Corp.	19.63	-0.13	-0.6
OTC	15.75	5.50	MICOM Communications Corp	6.38	0.75	13.3
OTC	13.50	5.88	Microcom Inc.	12.63	-0.13	-1.0
OTC	10.50	6.00	Netrix Corp	7.13	0.00	0.0
OTC	9.63	3.25	Network Computing Devices	7.75	-0.25	-3.1
NYS	27.88	8.13	Network Equipment Tech.	21.75	-1.75	-5.6
OTC	30.63	14.25	Network General	23.81	-0.19	-0.6
NYS	43.75	26.50	Newbridge Networks Corp	36.63	0.75	2.1
NYS	41.00	27.63	Northern Telecom Ltd.	39.00	0.75	0.7
OTC	23.25	13.50	Novell Inc.	19.88	0.25	1.3
NYS	43.13	35.50	Pyrex Corp	41.75	1.63	4.0
OTC	24.88	15.50	Octel Communications Corp. (N)	20.88	3.63	14.8
OTC	25.00	4.00	Optical Data Systems Inc.	22.75	-0.25	-1.1
OTC	0.00	2.13	Penril Data Comm Networks (N)	5.50	-0.12	-2.1
OTC	50.13	11.75	Picturetel Corp	47.38	1.13	2.4
OTC	8.13	2.13	Proteon Inc.	6.00	0.13	2.1
OTC	7.25	2.75	Racotek Inc.	5.50	-0.56	-9.2
OTC	6.00	1.50	Retix	4.75	0.75	18.8
NYS	24.88	16.31	Scientific Atlanta Inc.	20.13	1.13	5.9
NYS	46.38	39.25	Southwestern Bell Corp	44.50	1.38	3.1
NYS	40.13	25.88	Sprint Corp	34.88	2.63	8.1
OTC	31.63	12.50	Standard Microsystems Corp.	15.00	0.25	1.7
OTC	48.75	10.00	Stratacom Inc. (N)	48.25	3.25	7.2
OTC	8.13	3.88	Telebit Corp	7.25	-0.38	-4.9
OTC	108.00	24.00	US Robotics (N)	106.75	31.75	13.6
NYS	43.50	34.63	US West Inc	41.75	3.63	8.1
OTC	23.50	10.25	Ungermann-Bass Inc.	11.63	-0.25	-2.1
OTC	28.00	8.00	Xylogics Inc.	26.50	3.00	12.8
PC and Workstation Software						
OTC	8.75	3.50	Advanced Logic Research (N)	6.75	0.56	9.1
OTC	66.06	24.63	Apple Computer Inc	41.75	0.38	0.9
OTC	19.25	10.38	ASK Research Inc.	17.50	0.00	0.0
BYS	44.38	29.38	Compaq Computer Corp.	39.88	0.63	1.6
OTC	58.63	23.50	Dell Computer Corp	50.50	-2.63	-5.0
OTC	25.75	9.75	Gateway 2000 Inc.	26.75	0.50	2.6
NYS	75.00	35.94	Hewlett Packard Co.	75.00	5.63	8.1
OTC	16.25	2.50	Micron International Inc.	15.25	0.50	3.4
NYS	40.13	18.75	Silicon Graphics	38.88	2.25	6.0
OTC	30.50	18.75	Sun Microsystems Inc.	40.50	1.38	3.7
BYS	32.50	23.38	Tandy Corp	29.13	2.81	5.6
Data Systems						
ASE	11.63	5.25	Ambanc Corp	11.25	0.00	0.0
NYS	6.88	3.63	Convex Computer	6.50	0.50	13.5
OTC	0.22	0.16	Cray Computer	0.19	-0.01	14.3
OTC	24.00	14.63	Cray Research Inc.	23.00	0.00	0.0
NYS	12.00	4.25	Data General Corp	9.00	1.50	17.9
NYS	69.38	38.38	Digital Equipment Corp	66.88	2.25	3.3
OTC	5.38	1.06	Encore Computer Corp (L)	1.31	-0.19	12.5
OTC	18.50	6.50	Harris Computer Systems Corp	14.00	0.50	3.7
NYS	97.88	54.38	IBM	93.13	4.00	4.3
OTC	7.88	1.00	Meridian Data Inc.	5.75	2.50	56.6
OTC	12.25	4.25	Network Peripherals	6.50	0.38	7.3
OTC	21.25	11.25	Sequent Computer Sys.	17.88	2.75	18.2
OTC	5.88	3.13	Sequoia Systems Inc.	4.44	0.06	1.4
NYS	39.88	25.75	Stratus Computer Inc.	31.25	0.13	0.4
BYS	19.75	11.13	Tandem Computers Inc.	16.63	1.75	11.8
OTC	12.88	3.88	TriCord Systems	4.50	0.06	1.4
NYS	12.13	8.25	Unisys Corp	10.63	0.13	1.2
Software						
OTC	59.50	24.50	Adobe Systems Inc	59.50	3.00	5.3
OTC	5.88	2.50	American Software Inc.	5.13	-0.63	-10.9
OTC	10.75	9.38	Applix Inc.	22.63	-0.50	1.6
OTC	44.00	23.25	Autodesk Inc.	43.19	0.44	1.1
OTC	7.13	1.75	Bachman Info. Systems	7.13	1.00	16.3
OTC	32.00	22.00	BGS Systems Inc.	31.25	-0.23	-0.8
OTC	28.00	40.75	BMC Software Inc. (N)	26.50	6.50	9.1
OTC	31.25	14.50	Bogle & Babbage (N)	31.00	1.00	3.3
OTC	14.38	6.00	Borland Int'l Inc.	13.50	0.81	6.5
OTC	29.00	3.75	Brock Control Systems Inc.	2.38	0.13	1.7
OTC	3.75	1.78	CE Software	2.81	-0.06	-2.2
ASE	17.00	7.00	Cheyenne Software Inc.	17.88	1.88	11.7
OTC	28.00	9.75	Cognos Inc.	28.00	2.75	10.9
NYS	73.63	17.50	Computer Associates	69.63	4.50	6.7
OTC	6.50	2.50	Computervision Corp.	5.50	0.13	2.4
OTC	49.25	21.88	Compuware Corp.	33.63	3.63	12.1
OTC	20.25	9.00	Coresnare Inc	19.00	-0.75	-3.8
OTC	16.75	10.11	Corel Corp	15.63	0.63	4.2
OTC	14.25	7.25	Dataware Technologies Inc	14.25	0.25	1.6
OTC	4.88	1.88	Easel Corp	3.94	0.44	12.5
OTC	39.50	14.25	Fulcrum Corp (N)	39.50	5.75	17.0
OTC	8.75	1.00	4th Dimension	6.88	0.50	11.4
OTC	27.25	8.50	Frame Technology (N)	27.25	3.38	14.7
OTC	15.50	11.50	FTP Software Inc.	27.38	3.88	16.5
OTC	10.25	7.00	Group I Software	9.50	0.00	0.0
OTC	14.50	6.75	Gupta	9.38	0.13	1.3
OTC	11.75	4.63	Hogan Systems Inc.	10.13	-0.50	-4.7
OTC	49.75	21.25	Hyperion Software Corp	42.75	2.63	6.5
OTC	18.63	11.25	Information Resources (N)	13.00	-4.75	26.6
OTC	49.25	14.25	Informix Corp	47.63	2.25	5.0
OTC	14.50	7.50	Interactive Corp.	13.25	0.06	7.6
OTC	7.00	2.50	Interleaf Inc. (N)	7.00	0.63	9.8
OTC	22.25	8.63	Intersolv Inc. (N)	50.75	0.50	2.5
OTC	96.25	29.50	Intuit Inc	74.38	6.88	10.2
OTC	47.00	19.00	Legent Corp	46.19	0.50	1.1

Each	52-Week Range			Bid	Net Change	Pct Change
OTC	64.13	23.00	Lotus Development	63.00	-0.00	-0.1
OTC	10.38	3.63	Magic Software Enterprises	8.88	2.00	29.4
OTC	16.50	6.75	Mathematica Group Inc.	12.50	0.50	4.2
OTC	40.00	14.25	Mapinfo Corp	31.75	-2.00	7.9
OTC	6.00	1.44	MathSoft (N)	6.00	2.63	77.8
OTC	13.50	6.75	McAfee Associates	12.00	4.25	15.3
OTC	19.50	9.38	Metron Graphics	13.25	0.75	6.3
OTC	17.88	10.75	Micro Focus	13.50	0.13	1.0
OTC	8.00	0.63	Microdoft Inc	7.13	1.00	16.3
OTC	89.50	40.88	Microsoft Corp	86.81	2.00	2.6
OTC	22.50	5.63	Netmanage Inc.	16.50	0.75	4.8
OTC	38.50	22.66	Oracle Corp	37.38	1.25	3.5
OTC	49.00	21.38	Parametric Technology	44.63	1.88	4.3
OTC	24.25	9.00	PageMaker Systems Inc.	11.88	0.13	1.0
OTC	59.50	14.88	Peoplesoft	51.00	2.50	5.0
OTC	30.06	6.50	Phoenix Technologies	10.00	1.19	13.4
OTC	15.38	5.50	Platinum Software (N)	14.88	0.88	6.3
OTC	25.75	12.00	Platinum Technology	20.13	2.00	11.0
OTC	59.50	22.00	Progress Software Corp	50.88	-0.13	0.2
OTC	10.63	3.88	Quarterdeck Corp (N)	50.13	0.31	3.2
OTC	25.13	9.38	Rainbow Technologies Inc. (N)	24.13	0.88	3.8
OTC	6.00	2.00	Racotek Inc.	5.75	1.75	27.8
OTC	6.13	2.88	Ross Systems	5.63	0.75	18.6
OTC	12.00	0.50	Sapiens Int'l. Corp N.V	1.44	0.38	12.2
OTC	29.25	11.50	Softkey International Inc. (N)	29.13	4.44	18.0
OTC	6.25	2.88	Software Publishing Corp	4.00	0.50	14.3
OTC	12.50	5.75	Staffware Plc ADR	8.88	-0.13	1.3
NYS	38.88	25.00	Sterling Software Inc.	38.88	5.25	15.6
OTC	13.00	3.63	Structr Dynamics Research	13.69	-0.31	-2.2
OTC	55.00	19.88	Sybase Inc.	27.75	4.13	17.5
OTC	27.50	9.88	Symantec Corp. (N)	26.75	1.50	5.9
OTC	60.50	32.00	SynOptics (N)	60.25	1.50	2.9
OTC	30.00	20.63	System Software Assoc.	22.88	0.00	0.0
OTC	7.75	3.25	Tangic Corp	6.00	0.50	9.1
OTC	24.00	7.88	Viewlogic Systems	11.50	-0.50	-4.2
OTC	22.00	10.75	Vmark Software Inc.	17.50	0.50	3.0
OTC	10.75	4.63	Walker Interactive Systems (L)	5.13	0.13	2.5
OTC	55.50	15.00	Wall Data Inc. (L)	16.75	1.50	9.8
OTC	18.25	9.13	Wang Laboratories Inc	13.75	1.50	10.9
Semiconductors						
NYS	17.63	12.25	Advanced Micro Devices	15.13	0.75	5.2
OTC	35.00	16.66	Analog Devices Inc.	32.13	0.63	2.0
OTC	52.25	21.63	Atmel Corp (N)	51.00	1.75	3.6
OTC	11.13	5.63	Chips and Technologies	11.00	1.00	10.0
OTC	60.00	21.00	Cirrus Logic (N)	60.00	5.50	9.8
NYS	39.75	13.00	Cypress Semiconductor Corp (N)	30.75	3.50	8.7
NYS	20.25	13.50	Dallas Semiconductor	19.75	0.50	2.6
OTC	31.75	14.75	Integrated Silicon Systems	31.38	-0.25	-0.8
OTC	119.63	44.13	Intel Corp	116.75	3.25	2.9
NYS	77.25	22.50	LSI Logic Corp	75.13	5.63	8.1
OTC	15.50	15.50	Lattice Semiconductor	15.00	3.00	6.3
NYS	50.75	13.75	Micrel Semiconductor	50.13	2.13	4.4
NYS	64.75	43.38	Motorola Inc.	60.81	0.63	1.0
NYS	26.63	16.50	National Semiconductor (N)	27.13	0.00	0.0
OTC	37.00	6.75	Sierra Semiconductor	29.75	0.50	1.7
NYS	131.38	63.38	Texas Instruments	131.50	13.25	11.2
OTC	38.13	10.25	VLSI Technology	29.75	3.25	11.0
OTC	5.25	1.78	Weitek	4.50	-0.19	4.0
ASE	21.13	11.63	Western Digital Corp (N)	20.50	0.00	0.0
OTC	97.00	29.00	Xilinx	91.50	3.75	4.2
OTC	37.25	37.75	Zilog Inc	37.25	0.00	0.0
Peripherals and Subsystems						
OTC	21.75	14.38	American Power Conversion	21.63	2.63	13.4
OTC	17.00	13.00	Amptec Inc.	14.63	2.75	0.6
OTC	27.75	16.75	Banctec Inc	15.50	0.00	0.0
OTC	8.50	3.50	Cambex Corp (N)	8.50	1.50	12.5
ASE	4.75	1.50	Conntronics Corp	3.25	0.00	0.0
NYS	14.25	9.00	Conner Peripherals	13.00	-0.11	1.0
OTC	24.00	7.50	Creative Technologies Inc.	9.63	1.00	11.6
OTC	14.13	3.50	Data Race Inc.	12.00	-0.75	5.9
OTC	7.63	3.11	Dataram Corp	5.13	0.13	2.5
NYS	25.50	12.50	EMC Corp (N)	24.50	1.13	4.8
OTC	22.63	6.50	Emulex Corp	20.75	-1.13	5.1
OTC	16.38	11.75	Evans & Sutherland	14.50	-0.38	2.5
OTC	24.00	11.25	Exabyte	14.75	1.19	8.8
OTC	0.63	0.38	Intelligent Info. Systems	0.25	0.00	26.8
OTC	20.13	1.59	Komag Corp	20.00	0.50	2.3
OTC	6.25	2.00	MPL Systems Inc.	6.24	0.69	12.4
OTC	50.88	17.00	Komag Inc. (N)	50.00	0.88	1.8
OTC	6.63	2.63	Maxtor Corp (N)	6.31	0.44	7.4
OTC	11.50	4.00	Microboards Corp	3.81	-0.06	1.6
OTC	16.75	8.75	Pinnacle Micro Inc	11.00	0.00	0.0
OTC	28.75	5.81	Printronix Inc	23.75	-0.25	-1.0
NYS	10.75	5.13	QMS Inc.	5.50	-0.13	2.2
OTC	24.63	11.63	Quantum Corp. (N)	23.81	0.13	0.5
OTC	15.00	7.50	Radius Inc.	12.38	-0.31	-1.0
NYS	9.63	6.50	Recognition International	8.25	0.00	0.0
NYS	7.00	3.63	Reuzo Inc	4.63	-0.44	8.6
OTC	40.75	10.63	Seagate Technology (N)	40.75	1.00	2.5
NYS	39.13	17.88	Storage Technology	23.00	1.06	8.9
NYS	47.38	27.50	Tandberg Inc	44.75	0.75	1.7
NYS	125.88	90.81	Xerox Corp	116.88	4.25	3.8
Services						
OTC	24.75	14.31	American Mgmt. Systems (N)	23.50	0.81	3.7
NYS	3.50	0.50	Amacom Inc	0.94	-0.06	-6.3
OTC	27.75	14.50	Analysts Int'l	25.75	-0.25	-1.0
NYS	46.00	50.75	Auto Data Processing	62.00	0.63	1.0
OTC	36.75	14.00	Cambridge Tech. Partners	34.13	2.13	6.6
NYS	33.88	23.50	Computer Corp	34.75	1.63	4.9
BYS	30.88	30.13	Compuco Inc	30.38	0.25	0.8
OTC	16.13	5.50	Computer Horizons (N)	15.25	0.75	5.2
BYS	54.13	39.75	Computer Sciences	54.13	1.88	3.6
NYS	12.50	7.38	Computer Task Group	10.88	0.38	3.3
BYS	50.25	6.75	Compusa Inc	50.25	1.88	14.7
OTC	10.75	5.38	Condor Data Systems Inc.	9.75	-0.50	-4.9
OTC	12.11	6.13	Ingmar Discovery Software	11.88	0.81	7.5
NYS	64.50	33.00	General Motors E (EDS)	63.75	1.13	2.7
OTC	11.75	6.88	Inacom Corp	11.50	2.00	21.1
OTC	18.50	7.50	Intelligent Electronics	13.13	-0.88	-0.5
OTC	11.25	3.88	Micro Ed	6.50	0.25	4.0
OTC	21.63	9.38	Microage Inc.	13.25	1.75	15.2
OTC	34.50	19.00	Patchen (N)	34.50	3.25	12.2
NYS	31.61	10.63	Policy Management Sys.	44.50	-0.50	-0.8
NYS	30.88	22.25	Reynolds and Reynolds	29.00	0.00	0.0
OTC	22.75	16.75	Sei Corp	20.50	0.00	0.0
OTC	40.75	22.75	Shared Medical Systems (N)	38.75	4.81	14.2
OTC	6.00	4.00	Spl Systemhouse	6.50	0.19	-2.8
OTC	21.50	10.25	Software Spectrum Inc.	17.50	0.25	1.4
OTC	51.50	32.75	Sungard Data Systems (N)	50.75	0.00	0.0

KEY: (N) = NEW ANNUAL HIGH REACHED IN SESSION (L) = NEW ANNUAL LOW REACHED IN PERIOD

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RS/6000 ramp-up

IBM will boost the power of its entry-level and midrange RS/6000 Unix workstations today with the unveiling of five PowerPC 604-based workstations and a 604-based workgroup server. To stay competitive with midrange Unix workstations from rival vendors, it is also rolling out 604-based graphics boards.

In a briefing last week, IBM said it will show three 43P entry-level workstations running at 100, 120 and 133 MHz and priced between $6,205 and $7,820. Performance of the low-end models is said to be 30% to 100% better than that of the year-old 41T workstation. IBM will also unwrap the $11,500 C20 workgroup server and two graphics accelerators, all based on the 604 chip.

IBM's new PowerPC 604-based Unix workstations and graphics accelerators will ship in July

What users will not see is a free 604 upgrade for IBM's 9-month-old 601-based symmetrical multiprocessing servers, which the company promised last fall to deliver by midyear. In August, it will deliver a $15,000 dual-processor board that can turn four-way 601-based servers into six- and eight-way servers.

However, Irving Wladawsky-Berger, IBM's RS/6000 general manager, said IBM will eventually ship 604 upgrades for the 601-based G30, J30 and R30 Unix servers. "Whether it happens the end of this year or the first quarter [of 1996], we will honor every commitment we make," he said.

Later this year, IBM will announce some "small" 604 Unix servers, he said.

IBM will also introduce AIX 4.1.3, a version of its Unix operating system to support the new 604-based hardware. And new partitioning software will allow high-end IBM SP parallel processors to serve different applications to different user workgroups.

—Jean S. Bozman

IBM AS/400

CONTINUED FROM COVER 1

gain among the server models, which are specially packaged systems that cost far less than standard AS/400s but have limited capacity for host-based terminal applications. The servers are a key part of IBM's effort to dispel the dreaded traditional minicomputer image stuck to the 8-year-old midrange machine.

Until now, however, the servers have extended only one-third of the way up the AS/400 performance scale. But that limitation will largely be removed by the RISC servers, which should cover 80% of the new and improved throughput curve and outperform the current top-of-the-line AS/400 Model 320, sources said.

AS/400 users will have to be patient, however. The fastest server models are not expected to ship in volume until early next year along with the standard high-end RISC AS/400s [CW, April 10]. Still, the prospect of more muscular servers met with user approval.

"That's great news because that machine will scream. Those servers are very attractive in certain situations," said Scott Plumer, manager of platforms and integration services at Gannett Co.'s data center in Silver Spring, Md. Gannett has installed several of the original pre-RISC Advanced Servers.

The servers are effective for client/server uses with PCs and application development, Plumer said. Batch processing "just runs like a bat out of hell" even though IBM has not played up that fact. Price-wise, the machines "are a great deal" compared with a full AS/400, he added.

For example, the pre-RISC Model 30S server introduced a year ago costs $44,500, while a full AS/400 released at the same time with slightly less processing capacity sells for $198,500. Pricing on the RISC machines was not available last week.

The power of the RISC systems should help IBM fight back against allegations of weak-kneed performance that rival vendors "have used to pooh-pooh" the AS/400 despite its installed base of more than 300,000 machines, said David Peterson, a consultant in Rochester, Minn., who once worked at IBM.

The server models make the AS/400 "very appealing" for client/server uses, said Mike Farrell, a vice president of product planning at Automatic Data Processing, Inc. in Roseland, N.J. "If I had the luxury of starting fresh and coding with a nice PC front end, I'd jump on them right away."

On with the show

Initials the following products, according to industry sources:

- Support for NetWare and Notes on optional 486-based file server board
- OS/400 Version 3 Release 6 operating system for RISC systems and servers
- Improved DB2/400 database performance, including parallel querying
- Increased support for Unix Spec 1170 application programming interfaces
- Support for IBM's VisualAge C++ development tool

IBM unveils higher-capacity disk arrays. See page 71.

Novell's support on slippery slope

CONTINUED FROM COVER 1

cause WordPerfect built its reputation in part on its strong support, Novell, on the other hand, has never been able to keep pace with support calls.

Jan Newman, Novell's vice president of Premium Support in Orem, Utah, acknowledged that the "technical support staff declined 9% after the merger," and he added that the company is struggling to integrate NetWare and WordPerfect support. But he pledged that user complaints are not falling on deaf ears. Novell has in fact created a number of avenues to deal with technical complaints (see related story below).

Are you happy or having problems with Novell's support? Sound off to us at **talkback@cw.com.** *We'll publish a sampling of reader opinions in a upcoming issue*

"Our biggest problem is user accessibility to Novell technicians because of the sheer volume of calls," Newman said. "In March, we logged over 3.6 million tech support calls on our online forums and user groups on the Internet and CompuServe. That's a 500% increase over the 600,000 technical inquiries we got in March 1994." He claimed Novell adds support staff constantly, but he would not provide specific numbers.

Less than stellar

Gary Wilkerson, supervisor of end-user services at health care provider Kaiser Permanente Health Plan, Inc. in Atlanta, which has 40,000 NetWare users worldwide, said the cutbacks have contributed to a noticeable decline in WordPerfect's formerly stellar support. "The result has been a shifting of personnel and the departure of key technicians. And there's no such thing as NetWare support staff; that's why we have CNEs," Wilkerson said. Novell offers a training program for Certified NetWare Engineers (CNE).

The current NetWare support effort, while not as problematic as the WordPerfect side of the house, is no model program either. Even Novell Platinum resellers complain of routinely waiting hours on the phone — or sometimes waiting days for a return call — to successfully resolve thorny technical problems.

Dave Costello, engineering manager at Computer Mart in Bedford, N.H., generally gives Novell good marks for technical support. But last week he asserted, "It's not acceptable to be at a user site, phone Novell and sit on hold listening to Muzak for 30 to 60 minutes."

Those complaints were echoed by Dean Johnson, information delivery manager at Freudenberg-NOK GP, an auto parts manufacturer in Bristol, N.H., that has 1,500 NetWare users at 15 sites.

"The support [has] literally gone away," Johnson said. "Our reaction has been to do all of our own troubleshooting whenever possible. And when we can't, we use old NetWare 3.x [personal identification] numbers to avoid paying $100 to $200 each time we call Novell support."

Getting the runaround

Newman maintained that corporate users with Premium Support such as Wilkerson and Johnson should contact their sales account managers or Novell executives when they are dissatisfied with service. But Wilkerson said he has waited "as long as nine days to get a response from Novell, and complaining has gotten me nowhere."

Newman also said that "for really tough issues that can't be resolved without getting a Novell developer involved, we will make special arrangements to compensate them for their troubles."

Greg Smith, manager of systems at VP Solutions, Inc., a Novell Gold reseller in Framingham, Mass., gave Novell technical support a "fair" or average rating last week. He noted that the level of support and timeliness of the callbacks users receive depends on the product.

"Surprisingly, the UnixWare and Flex IP support has been very good. The support for NetWare 3.x and 4.x is OK, but it may take a day or two for a response," Smith said. He also rated the NetWare for Systems Application Architecture support as "not very good."

Internetworking vendors respond to users' demands for better service. See page 61.

Hot line resolution

To respond more quickly to user complaints, Novell has revamped the former WordPerfect's toll-free suggestion line and installed a new fax hot line, which gives users two more avenues to air support grievances.

Jan Newman, Novell's vice president of Premium Support, said users can call the "Make-It-Perfect Line" suggestion line at (800) 861-3367 and leave a detailed message listing their complaints or comments. Users can also fax their complaints to (801) 222-4377.

These messages will be routed to the appropriate Novell technician, salesperson or company executive, who will call the customer usually within 24 hours, Newman said.

Users can also write Novell at 1555 North Technology Way, MS ORM-G-100, Orem, Utah 84057-2399.

—Laura DiDio

RAID invades new turf

RAID arrays used to look like disk drives bound together with bailing wire, low-grade substitutes for the real thing. RAID was an idea from the University of California at Berkeley, and in 1988, the year of its birth, it was an idea whose time had not yet come.

Part of the novelty of RAID was the chance it offered to introduce human error into efficient, if expensive, large storage systems. And at early installations, it frequently did, as RAID managers struggled to change their configurations or add capacity.

What a difference several years make. RAID is now the dominant form of large system storage, and the small drives that RAID is built on have dropped in price and grown in reliability as their mean time between failures has zoomed up to 500,000 hours from a modest 40,000.

What a difference several years make. RAID is now the dominant form of large system storage.

Charles Babcock

Now, innovative RAID suppliers such as EMC in Hopkinton, Mass., are producing RAID subsystems that can incorporate the characteristics of several levels of RAID. And Hewlett-Packard is preparing to introduce a storage subsystem that breaks down the dividing lines between RAID levels, dynamically reconfiguring itself across three levels.

EMC last month shipped a RAID-Symmetrix (RAID-S) configuration of its Symmetrix 5000 line that meets RAID Level 4 and 5 standards and also qualifies for the recent RAID Advisory Board specifications for RAID Level 7, according to company representatives.

RAID-S moves the task of generating parity protection — the information that indicates how to reconstruct data in the event of a drive failure — from the controller microcode down to the drives themselves. A microprocessor on each drive generates the parity information.

Three volumes of data are each stored on separate drives of a four-drive group, with their parity information stored on the fourth. Another three-volume set of data might be stored on a different combination of three drives, with the parity information also moving to a different drive from the first. Instead of being striped across a set of drives, the data volumes are kept intact on single drives. Because of this pattern, some data may be recovered even if two drives fail at the same time. In RAID 4 and 5, the loss of more than one drive results in the loss of data for the entire group.

HP is trying to reduce the chance of manager error by having the system determine what RAID configuration is best for the current task and dynamically reconfigure itself. Frequently accessed data is stored in a RAID Level 1 type of configuration, and inactive data is kept in a lower-cost RAID 5 type of arrangement. HP's upcoming AutoRaid does this in ways that defy standard RAID definitions, so technically it can't be called RAID at all.

AutoRaid is not an announced product yet, but "we're getting very close," said Roger Buckthal, project manager at HP's Storage Division in Boise, Idaho.

AutoRaid uses a new set of algorithms to map the addresses of data blocks. Changing system needs activate different addressing algorithms while maintaining the way the host views the data blocks. The subsystem can mimic a typical RAID 1 arrangement with standby mirrored disks. Or it can reserve space on each disk as a collective hot spare, gaining savings and efficiency from the use of all heads and spindles in the array.

HP claims the system can reconfigure itself or add new units in seconds. It can also mix disks of differing speeds and capacities.

The new thinking in RAID recognizes that its original lines of demarcation were really fault lines capable of shifting and yielding new configurations. In the process, RAID is becoming more flexible, less prone to human error and more capable of dynamic self-management.

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Inside Lines

Sybase denies takeover rumors

Sybase stock page-etched all over the map last week as wild rumors spread that the database maker is a takeover target. While industry gossips named IBM, Sun Microsystems, Microsoft and HP as potential buyers, Sybase shares jumped up $8 early last week, then sank by just as much. Sybase officials were mystified. "Our policy is to never comment on acquisition rumors, but in this case, I have to say that we're not aware of any basis for this rumor," said Kathy Nyrop, Sybase treasurer.

Hen's teeth and PowerPC chips

It looks like the 604 chip is not the only PowerPC chip in short supply. According to some vendors readying PowerPC products for this week's PC Expo in New York, it seems the recently introduced 603E chip is also a pretty scarce commodity. The chip — an enhanced version of the 603 chip — is aimed primarily at the portable marketplace because of its low power consumption and heat dissipation.

What, no preppies at IBM?

IBM, one of the main proponents of the PowerPC Reference Platform (Prep) standard, is about to deliver systems that are decidedly *not* Prep-compliant. The raft of PowerPC systems IBM will be announcing this week do not contain the necessary Open Firmware code. Vendors were supposed to incorporate that code by this month for their systems to become fully Prep-compliant. Open Firmware is a piece of code whose task is to ensure that add-on cards will be compatible across different PowerPC platforms. The idea is to create a big, unified market for add-on card manufacturers and push rapid development of standards-based peripherals for PowerPC systems. Well, take a deep breath and hold it.

Some say SuperNOS, some say SuperNOT

The grand plan at Novell calls for NetWare and UnixWare to merge on top of a new microkernel, yielding an all-purpose network operating system that can run powerful applications. This "SuperNOS" should emerge in 1997, according to the timetable. But developers haven't yet decided which microkernel components to build on, causing some grumblers inside Novell to rename the project SuperNOT.

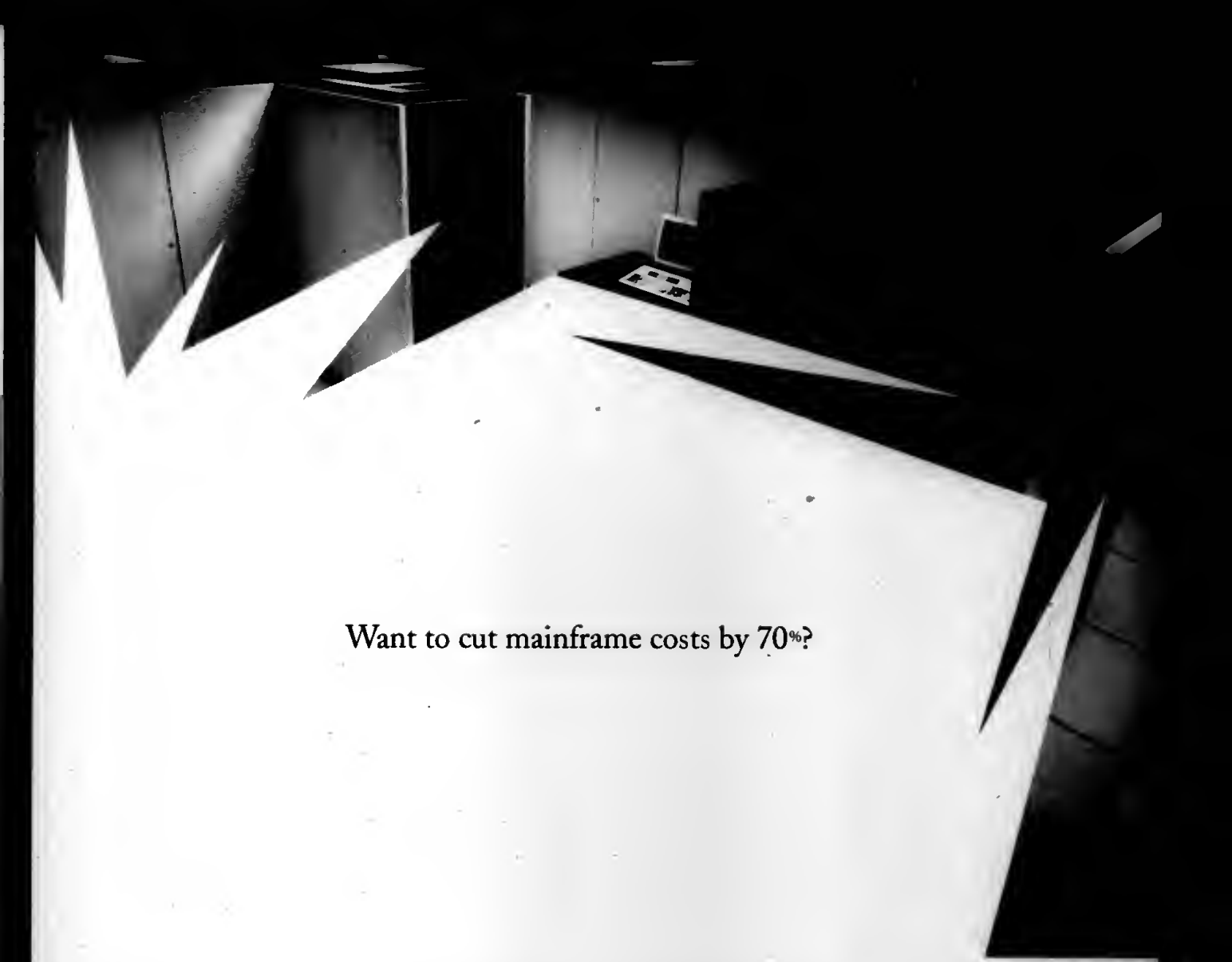
It's not (all) Hollywood anymore . . .

Silicon Graphics plans to turn its gaze from the glaring lights of Hollywood and start a 200-person division focused on Unix servers running off-the-shelf relational databases. At an announcement scheduled for Monday, the $1.5 billion firm will reveal its plans to be the first Unix player with full 64-bit operating systems and hardware that will allow users to build multiterabyte data warehouses. Those 64-bit SGI Challenge systems will be announced by year's end, said Ihab Abu-Hakima, director of marketing for the new Network Systems Division.

Woof!

Remain leery of service providers who claim they can handle both voice and data communications functions for you, a Gartner Group research director advised clients last week in Chicago. "They remind me of the veterinarian and the taxidermist who bundled their services, then came up with the slogan 'Either way, you get your dog back.'"

Songs of praise are being penned (and maybe even sung, which is the scary part) about IBM Chairman Lou Gerstner for his lead role in pulling the company back from the abyss. We offer here the immortal words written by grateful members of Ex-IBM, a group of IBM retirees. To the tune of "Amazing Grace," everyone: "Amazing Lou! How sweet the sound/That saved our IBM!/It once was lost, but now it's found/Was weak, but now's a gem!" And no, we are not making this up. But if you'd like to make up your own song for Lou, or just pass along a few news items or tips to Computerworld, our 24-hour voice-mail tip line is at (508) 820-8555 and our toll-free number is (800) 343-6474. News editor Marytran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.



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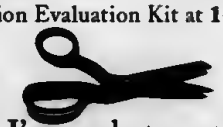

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